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DEPARTMENT OF COMMERCE AND LABOR
COAST AND GEODETIC SURVEY
O. H. TITTMANN, Superintendent

SURVEY OF OYSTER BARS

CHARLES COUNTY MARYLAND

DESCRIPTION OF BOUNDARIES AND LANDMARKS AND REPORT OF WORK OF UNITED STATES COAST AND GEODETIC SURVEY IN COOPERATION WITH UNITED STATES BUREAU OF FISHERIES AND MARYLAND SHELL FISH COMMISSION

By C. C. YATES
CHIEF OF COAST AND GEODETIC SURVEY PARTY
ASSISTANT, COAST AND GEODETIC SURVEY

WASHINGTON
GOVERNMENT PRINTING OFFICE
1911

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DEPARTMENT OF COMMERCE AND LABOR
U.S. COAST AND GEODETIC SURVEY
O. H. TITTMANN, Superintendent

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LETTER OF SUBMITTAL.

DEPARTMENT OF COMMERCE AND LABOR,
COAST AND GEODETIC SURVEY,
Washington, January 27, 1911.

SIR: I have the honor to transmit herewith a report of the officer detailed from the Coast and Geodetic Survey to cooperate with the Bureau of Fisheries and the Maryland Shell Fish Commission in surveying the oyster bars of the State of Maryland, together with certain technical results which are necessary for the interpretation and use of the plats of the survey made by the Government.

This work has been done under the provisions of the act of Congress entitled "An act to authorize the Secretary of Commerce and Labor to cooperate, through the Bureau of the Coast and Geodetic Survey and the Bureau of Fisheries, with the shell fish commissioners of the State of Maryland in making surveys of the natural oyster beds, bars, and rocks in the waters within the State of Maryland," approved May 26, 1906, and of the acts of Congress making appropriations for sundry civil expenses of the Government for the fiscal years ending June 30, 1907, 1908, 1909, and 1910.

Respectfully,

O. H. TITTMANN, *Superintendent.*

To Hon. CHARLES NAGEL,
Secretary of Commerce and Labor.

CERTIFICATION.

BALTIMORE, MD., *January 25, 1911.*

The following publication is certified to contain correct technical descriptions of all boundaries and landmarks established in Charles County by the Maryland Shell Fish Commission in cooperation with the United States Coast and Geodetic Survey.

C. C. YATES,
Chief of Coast and Geodetic Survey Party,
Assistant, Coast and Geodetic Survey.

BALTIMORE, MD., *January 25, 1911.*

Examined and certified to be correct.

WALTER J. MITCHELL,
CASWELL GRAVE,
BENJAMIN K. GREEN,
Maryland Shell Fish Commission.
SWEPSON EARLE,
Hydrographic Engineer.

NOTE.—Certified copies of this publication and of the charts of the natural oyster bars of Charles County were filed in the office of the clerk of the circuit court of Charles County and in the office of the Board of Shell Fish Commissioners on January 27, 1911.

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SURVEY OF OYSTER BARS, CHARLES COUNTY, MD.

INTRODUCTION.

PUBLICATIONS.

The preparation of publications relating to the survey of the oyster bars of Maryland has been divided between the Government and the State in accordance with the laws [a] authorizing the work and the natural division of the surveying operations [b] of the cooperating forces.

The publications prepared and issued by the Government under the direction of the Superintendent of the Coast and Geodetic Survey consist of a series of charts and a technical report for each county surveyed.[c] The charts show all legal boundaries of oyster bars within the adopted boundaries of the waters opened up for leasing with each county, and the location of all landmarks (Coast and Geodetic Survey triangulation stations) used as a foundation for the delineation of these various boundaries. The technical report gives technical and legal descriptions of all oyster bar and other boundaries, and descriptions of all landmarks shown on the charts, and includes the report of the representative of the Coast and Geodetic Survey in charge of the work of that service in cooperation with the Bureau of Fisheries and the Maryland Shell Fish Commission. These charts and technical reports are prepared and certified for file with the courts and the Commission, as required by the laws of the State, and contain all information necessary to make a permanent record of the work of the Commission and the Government for all future requirements of the courts, or for any resurveys that may become necessary.[d]

The publications prepared and issued by the State under the direction of the Shell Fish Commission consist of annual reports[e] of all the operations of the Commission

[a] See Appendix A for laws relating to the cooperation of the Coast and Geodetic Survey and Bureau of Fisheries with the Maryland Shell Fish Commission.

[b] See Appendix C for a summary of the particular surveying operations which constitute an "oyster survey" as now being carried on in Maryland.

[c] These charts and technical reports can be obtained by application to the Superintendent of the Coast and Geodetic Survey at Washington, D. C. The publications now ready for issue are those for Anne Arundel, Somerset, Wicomico, Worcester, Calvert, and Charles counties.

[d] The technical records and charts for each county are published separately on account of the requirements of the oyster-culture laws of the State and the practical considerations which make it desirable to have each county "opened up" for oyster culture as soon as practicable after the completion of its survey. For these reasons and the fact that these reports are each arranged for distribution and use in one county only without reference to other published records, much of the text of this publication is of necessity identical with similar previous publications for other counties.

[e] These reports can be obtained by application to the Shell Fish Commission, Marine Bank Building, Baltimore, Md. They are issued annually in October, and the first and second reports are now available for distribution.

performed under the provisions of the laws of Maryland,[a] including results of biological and economic oyster investigations, methods and results of the hydrographic survey of the boundaries of oyster bars and crab bottoms, the administrative report and financial statement of the Commission, information relating to oyster culture, methods of surveying and leasing of oyster lots, and much other important matter of legal and scientific value.

These two sets of publications are planned and arranged to supplement each other without unnecessary duplication, and when combined they form a complete report of operations, methods, and results of the work of both the Government and State.[b]

COOPERATION OF THE COAST AND GEODETIC SURVEY.

The work of the Coast and Geodetic Survey, as the name of the service indicates, includes a survey of the coasts of the United States made on a geodetic basis. This has involved the gradual construction of a great framework of interstate triangulation for use as a foundation for detail hydrographic and topographic surveys, from which there has been compiled and published a complete set of charts of the coasts of the United States, including all waters of Maryland where oysters grow. This existing triangulation, hydrography, and topography is essential as a foundation for a correct and practical survey of natural oyster bars; and it being one of the fundamental functions of the Coast and Geodetic Survey to furnish such data, the cooperation of the Coast and Geodetic Survey with the Bureau of Fisheries and the Maryland Shell Fish Commission is a practical and natural development of Government work leading to the conservation and increase of the supply of food.

COOPERATION OF THE BUREAU OF FISHERIES.

The Bureau of Fisheries has cooperated with the Coast and Geodetic Survey and the Maryland Shell Fish Commission principally as an adviser in matters relating to the biological and economic survey of oyster bars and the methods to be employed for that purpose.[c] A steam launch, rowing boat, and certain apparatus have also been furnished.

The primary function of the Bureau of Fisheries is to increase the productiveness of marine and fresh waters by such measures as may be best suited to the purpose, and the services rendered in connection with the survey of the oyster bars of Maryland are strictly in line with the fundamental law under which it acts. In certain States other than Maryland similar work has been conducted by the Bureau acting independently, the same ends being attained at greater expense to the Government.

GENERAL STATEMENT OF WORK OF COAST AND GEODETIC SURVEY.[d]

The results obtained from the work of the Coast and Geodetic Survey in cooperation with the Bureau of Fisheries and the Maryland Shell Fish Commission need very

[a] See Appendix B for an extract from the "Second Report of the Maryland Shell Fish Commission," giving a concise summary of the "Haman Oyster Culture Law."

[b] See Appendix D of this publication for "Statistics of results of combined operations of the Government and State."

[c] Hon. George M. Bowers, Commissioner of Fisheries, has detailed for this service Dr. H. F. Moore, Assistant, Bureau of Fisheries.

[d] For a detail statement of the very large amount of excellent oyster survey work of the Maryland Shell Fish Commission see the "Annual Reports of the Maryland Shell Fish Commission."

little other summary than is indicated by the published "Charts of Natural Oyster Bars" and the index of hydrographic projections and triangulation stations shown on the county progress maps attached to each report.

The triangulation has been carried on in accordance with the standard methods of the Coast and Geodetic Survey, making this work and that of the "Descriptions of Triangulation Stations" of permanent value, not only to the State of Maryland in the survey of her oyster bars, but also to the Government for any future work it may do in the regions covered by the oyster-survey operations.

The hydrographic projections and published charts are prepared with all the accuracy permitted by their large scale, especially as to the boundaries of the various shell-fish bottoms in relation to landmarks, but this accuracy of location on the charts is further added to and permanently fixed by published technical descriptions which should minimize the probability of any future dispute as to either landmarks or boundaries.

Stated another way, and quoting from the report of the "Survey of Oyster Bars of Anne Arundel County":

> The geographic positions of the permanent landmarks and signals have been determined with the usual precision of a trigonometric survey, and their locations at all points necessary to provide ample foundation for the surveying and charting operations permitted great accuracy of definition and location for the natural oyster bar and other boundaries established. At the same time, the very important element of permanency of the positions of boundaries has been secured, as the relocation of geodetic positions can always be accomplished by a competent surveyor, even though the original landmarks and monuments have been washed away, as has been the fate of hundreds of such points established by the Coast and Geodetic Survey on the shores of the Chesapeake Bay during the last 65 years.

REPORT OF THE WORK OF THE COAST AND GEODETIC SURVEY IN CHARLES COUNTY.

INSTRUCTIONS.

The following letters, together with the laws[a] of the United States relating to the subject, constitute the "instructions" received by the chief of the Coast and Geodetic Survey party engaged on work in connection with the Maryland Shell Fish Commission. They are short and definite, but furnish ample authority and leeway for all legitimate development of the cooperation of the Government and the State in the survey of oyster bars. The "free hand" permitted by these orders, together with the aid and many valuable suggestions received from the officers of the survey at Washington, have proved very beneficial to the work and are greatly appreciated.

DEPARTMENT OF COMMERCE AND LABOR,
OFFICE OF THE SECRETARY,
Washington, June 2, 1906.

SIR: In reply to your letter of May 28, requesting me to designate officers of the Coast and Geodetic Survey and of the Bureau of Fisheries to cooperate with the State of Maryland in making survey of and locating the natural oyster beds, I have the honor to inform you that Mr. C. C. Yates will be designated to cooperate on the part of the Coast and Geodetic Survey as soon as Congress makes the provisions of the act effective by providing an appropriation for the purpose.

Respectfully,

LAWRENCE O. MURRAY, *Assistant Secretary.*

His Excellency Hon. EDWIN WARFIELD,
Governor of Maryland, Annapolis, Md.

DEPARTMENT OF COMMERCE AND LABOR,
COAST AND GEODETIC SURVEY,
Washington, July 3, 1906.

SIR: Upon the receipt of these instructions you will surrender the command, accounts, etc., of the steamer *Endeavor* to the Hydrographic Inspector. * * *

As soon as this transfer is completed you will enter upon the duties of Coast Survey representative on the Shell Fish Commission of Maryland.

You will consult the Commissioners, prepare a programme of work, and submit estimates in the usual form.

You are authorized to come to Washington for consultation from time to time as may be necessary.

* * * * * * *

Very respectfully,

O. H. TITTMANN, *Superintendent.*

Capt. C. C. YATES,
U. S. C. and G. S. Steamer Endeavor, Baltimore, Md.

[a] For these laws see Appendix A.

ORGANIZATION AND EQUIPMENT.

The personnel and occupation of the party of the Coast and Geodetic Survey have remained practically unchanged since the beginning of the "oyster survey." Besides the chief of party, it consists of the necessary triangulators, computers, draftsmen, and temporary employees required to carry on both the surveying operations in the field and the preparation for publication of oyster charts and technical records in the office at Washington.

The equipment for the work of the party has been ample and satisfactory. The large living and office quarters furnished the Government on the Maryland Shell Fish Commission house boat *Oyster* have been very convenient for the work, besides facilitating efficient cooperation with the surveying and oyster investigation parties of the State. In addition to the accommodations on the *Oyster*, the Coast and Geodetic Survey party has had the constant use of the large steam launch *Inspector* and several other boats furnished by its own service, and the occasional use of the Bureau of Fisheries launch *Canvasback* [a] and the steamer *Governor McLane* [b] of the State fishery force.

The greater part of the equipment of instruments for the operations of both the Government and State has been furnished by the Coast and Geodetic Survey and consists of all necessary theodolites, levels, sextants, drafting instruments, hydrometers, etc., required for all field and office work.

CRONOLOGICAL STATEMENT OF WORK.

The field work of the Coast and Geodetic Survey in Charles County [c] dates from August 18, 1908, when the house boat *Oyster* was moved from St. Leonards Creek to an anchorage in Battle Creek which is located about 5 miles to the south of that small portion of Charles County bordering on the Patuxent River. The headquarters of the surveying operations remained at this harbor until the completion of that part of the field work which naturally included all of the Patuxent River waters of Calvert and St. Marys counties as well as those of Charles County, although the results are published separately.

On September 3, 1908, the house boat finally left the Patuxent River for a new anchorage in one of the tributaries of Potomac River in St. Marys County, and the field work in Charles County was dropped from that date for a period of nearly two months.

On October 28, 1908, the house boat *Oyster* was towed by the *Governor McLane* to an anchorage in the lower part of Wicomico River off Rock Point in Charles County. From this anchorage as a headquarters the surveying operations for the Wicomico waters of both Charles and St. Marys counties were carried on until practically completed on November 25, 1909, when the house boat was towed to Bretons Bay off Leonardtown in St. Marys County.

On December 2, 1909, it was found necessary to obtain additional triangulation information for the publication of the technical report for Calvert County, which inci-

[a] By courtesy of Dr. H. F. Moore, United States Bureau of Fisheries.

[b] By courtesy of Capt. James A. Turner, commanding.

[c] The field work of Charles, Calvert, and St. Marys counties was so intermixed in the Patuxent River that the chronological statement of work for any one of these counties necessarily includes a considerable part of the work of the other counties.

dentally involved new work required for the report for Charles County, and field work was carried on for that purpose from that date to December 8, 1909.

Again from July 20 to August 11, 1910, while the house boat *Oyster* was anchored in the mouth of the Patuxent River for the purpose of carrying on the oyster survey operations in the bay shore waters of Dorchester County, a number of days when work could not be done in the open bay were employed in checking up deficiencies in the description of stations required for the forthcoming publications of both Charles and St. Marys counties.

The large amount of office work connected with the "oyster survey" of Charles County, including computations and drafting necessary for the preparation for publication of the oyster charts and the technical records, was continued intermittingly with the office work of other counties from the beginning of the field work in Charles County to the time of filing of the certified oyster charts and technical reports in the archives of the Commission and with the clerk of the circuit court of Charles County on January 27, 1911.

STATISTICS.[a]

Landmarks and triangulation signals erected	37
Monuments planted to mark triangulation stations	37
Triangulation stations occupied for observations of horizontal angles	35
Old triangulation stations recovered	3
New triangulation stations established	39
Total old and new triangulation stations marked and described	42
Linear miles of shore line covered by triangulation (approximate)	32
Square miles covered by triangulation (approximate)	20
Hydrographic projections prepared and completed as records of oyster boundaries	3
Triangles computed	80
Geographic positions computed	40
Corners of oyster boundaries established by computation	78
Back azimuths and distances computed from corners of boundaries to triangulation stations	234
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Descriptions of oyster boundaries prepared for publication	15
"Charts of Natural Oyster Bars" prepared for publication	1
Progress map prepared for publication	1

GENERAL REMARKS.

Before ending this report the representative of the Coast and Geodetic Survey wishes to renew his statement of appreciation of the courteous assistance received from various Government and State officials and others interested in the oyster industry of Maryland, especially to the following:

To his colleague from the Department of Commerce and Labor, Dr. H. F. Moore, of the Bureau of Fisheries, whose well-known scientific knowledge of all matters relating to oysters has been of great value to the work.

[a] These statistics only include field and office work directly performed by the party of the Coast and Geodetic Survey in connection with the oyster survey of Charles County, and do not include the many thousands of soundings and examinations of the character of the bottom made by the engineers of the Commission, which are of considerable value to the Coast and Geodetic Survey as hydrographic records for future use in connection with the preparation of new editions of charts of the waters of Maryland. See Appendix D of this publication for "Statistics of results of combined operations of the Government and the State."

To Mr. Walter J. Mitchell, chairman of the Maryland Shell Fish Commission, who, by his administrative ability in carrying out the complicated requirements of the oyster laws and by his unfailing tact, has made the cooperation of the various services engaged on the work both agreeable and effective.

To Dr. Caswell Grave, secretary of the Commission, who, as editor of the Commission's annual report and Commissioner in charge of the biological and economic oyster investigations, has been brought into constant contact with the Government work and aided its operations in every way.

To Mr. Benjamin K. Green, treasurer of the Commission, who has looked after the equipment and commissary of the house boat in such a way as to add greatly to the comfort and convenience of the party of the Coast and Geodetic Survey.

To Mr. Swepson Earle, hydrographic engineer to the Commission, whose knowledge of the work from former service in the Coast and Geodetic Survey has greatly facilitated his practical use of the technical data furnished by the Government.

To Mr. Thomas H. Robinson, counsel to the Commission, for courteously furnishing valuable information relating to county boundaries.

And to the many others connected with the Commission or who as residents in the locality where the work was being carried on have greatly assisted by furnishing important information or willing services.

CHARTS AND MAPS.

CHARTS OF NATURAL OYSTER BARS.

The charts [a] of the natural oyster bars of Charles County, published by the Coast and Geodetic Survey from results of surveys of the Government in cooperation with the Maryland Shell Fish Commission, are grouped on one sheet covering a portion of the waters of the upper Patuxent River and all of the waters of the Wicomico River, including all oyster-producing bottoms in Charles County. They are published on a scale of 1 part in 20,000 (approximately 3⅓ inches to a statute mile) and are constructed on polyconic projections and based on the United States standard datum of the Coast and Geodetic Survey.

These charts show all oyster bars and other boundaries established by the Commission, and are certified for the purpose of filing in the office of the clerk of the Circuit Court of Charles County and in the office of the Commission at Annapolis, as required by the oyster laws of Maryland.

In addition to the oyster bar and other boundaries, the charts show the location and name of all landmarks (U. S. Coast and Geodetic Survey triangulation stations) used in making the survey, together with the hydrography and topography [b] necessary to make the technical definitions and delineations of boundaries readily understandable both by the people engaged in the oyster industry and the general public who may become interested through leasing of barren bottoms for oyster culture.

The names of the oyster bars are those used locally, as nearly as could be ascertained by the hydrographic engineer of the Commission. When there was no local name in common use, a name was selected from one of the prominent features of the vicinity. By the use of recognized names or those that would naturally suggest certain sections of water, it is believed that much confusion will be avoided in the location on the charts of the oyster bars, especially by those not familiar with the use of maps.

The corners of the oyster bars are numbered from 1 to the total number of corners in each area under consideration. Where boundaries adjoin, making one point a corner of two or more oyster bars, these points have two or more numbers, each number corresponding to the bar in which the figure is located. The numbers of the corners correspond with the technical and legal descriptions of this publication under the heading "Boundaries of natural oyster bars."

The landmarks and oyster bars have been grouped in the "Contents" of this publication in accordance with the charts upon which they are shown. To find a particular

[a] These charts can be obtained by application to the Superintendent of the Coast and Geodetic Survey, at Washington, D. C.

[b] Much of the detail of the inshore topography was obtained from the excellent map of Charles County, prepared and published by the Maryland Geological Survey under the direction of Dr. William Bullock Clark from surveys of the Maryland Geological Survey in cooperation with the U. S. Geological Survey.

oyster bar or landmark which is only known by name, consult the "Contents" and the desired chart and general location will be indicated. To find the name of a bar or landmark which is only known by location, consult the progress map at the end of this publication for the number of the chart on which it is to be found, and then examine the known locality on the chart for the name of the bar or landmark in question.

The contours on the charts showing the depth of water at mean low tide have been taken from the hydrographic sheets of former work of the Coast and Geodetic Survey. Four curves were selected as being the most convenient for taking off from the original hydrographic sheets and the ones of greatest value to those interested in shell fish industries. The 1-fathom contour (6 feet) and the 5-fathom curve (30 feet) correspond in a general way to the inner and outer limits of all the oyster bars surveyed. The 3-fathom contour (18 feet) furnishes the curve of about the average depth of water on the oyster bars and the 10-fathom contour (60 feet) serves in a general way to indicate the outer limits of probable oyster culture.

The boundaries of the waters within the "territorial limits of the county" and the boundaries of the "waters contiguous to the county" opened up for the leasing with Charles County are plainly indicated on the charts. A full technical description of these boundaries is given in this publication under the heading "Boundaries of county waters."

The areas in acres of the oyster bars were determined under the direction of the hydrographic engineer of the Commission by two independent planimeter measurements of the areas as delineated on the smooth projections of the Coast and Geodetic Survey. These areas are given in small figures in parentheses on the face of the chart within the boundaries of the different shell fish bottoms.

The symbols used on the charts for the different kinds of boundaries, triangulation stations, contours of depth of water, etc., require no other explanation than that given in the legend and other notes on the face of the charts.

LEASING CHARTS.

The leasing charts of Charles County, like those for Anne Arundel, Somerset, Wicomico, Worcester, and Calvert counties, have been prepared under the direction of the hydrographic engineer of the Commission. These charts are constructed on polyconic projections and are based on the United States standard datum of the Coast and Geodetic Survey. They are made on the scales of 1 part in 5,000 or 1 part in 10,000, as the needs of oyster culture may require. Anne Arundel County required 13 leasing charts; Somerset County, 12 charts; Wicomico County, 2 charts; Worcester County, 3 charts; Calvert County, 5 charts; and Charles County, 2 charts, to cover their oyster bottoms.

These charts show all the oyster bars, crab bottoms, and clam beds and other boundaries established by the Commission, and also all boundaries of oyster lots leased for the purpose of oyster culture, thus making them comprehensive and valuable records of the results of the operations of the oyster-culture laws.

The lots leased under the provision of the "old 5-acre law" are frequently of irregular shape, but the lots leased under the provision of the new oyster laws must be of rectangular shape by the terms of that act. For this latter purpose the leasing charts

have been divided by parallels of latitude and meridians of longitude into small rectangles of 1 acre or 5 acres, as may be best suited to the area under consideration, and prospective leaseholders by the rules of the Commission are compelled to select whole rectangles as far as possible.

For reasons of the present changeable nature of the number of lots leased and the large number of charts required, the leasing charts are not likely to be published for some years, but they can be seen at any time on file at the offices of the Commission, in the Marine Bank Building at Baltimore.

PROJECTIONS.

The polyconic projections[a] covering Charles County waters are 3 in number and on the scale of 1 part in 10,000. They were constructed by draftsmen of the Coast and Geodetic Survey, but the sextant positions which determine the location of the legal boundaries of the oyster bars as delineated by the Shell Fish Commission were plotted by the draftsman of the Commission.

A copy of each of these projections, with all the plotted positions of triangulation stations, shore line, sextant positions, and boundaries of oyster bars, was made under the direction of the hydrographic engineer of the Commission by pricking through with a sharp needle the intersections of the projection lines and all other points as plotted on the original sheets.

These projections (in duplicate) are the original records of all oyster bar and other boundaries established by the Commission, one set being filed in the archives of the Coast and Geodetic Survey, at Washington, and the other set in the archives of the Shell Fish Commission.

PROGRESS MAPS.

The progress map to be found at the end of this publication is on a scale of 1 part in 100,000, and shows in outline the work accomplished by the United States Coast and Geodetic Survey in Charles County and contiguous waters. It gives the scheme of all the charts and smooth projections constructed in connection with the survey, the location and names of all triangulation stations used as a basis for the surveying work, and the "boundaries of county waters" established by the Commission for the purpose of carrying out the laws of Maryland relating to oyster culture.

Besides indicating the amount of work done by the Coast and Geodetic Survey in connection with the work of the Shell Fish Commission, this progress map will be of special value for index purposes to engineers and others searching for the particular chart or projection covering the locality of the oyster bars or landmarks that may be under consideration.

The progress maps[b] accompanying the first and second annual reports of the Maryland Shell Fish Commission were prepared under the direction of the hydrographic engineer of the Commission. They are on the scale of 1 part in 400,000, and show the outline of the tide-water counties of Maryland, with shaded areas to indicate the waters already covered by the operations of the oyster survey.

[a] For the scheme of these projections see the progress map at the end of this publication.

[b] These maps and reports can be obtained by application to Maryland Shell Fish Commission, Marine Bank Building, Baltimore, Md.

BOUNDARIES OF THE COUNTY WATERS.[a]

WATERS WITHIN TERRITORIAL LIMITS OF COUNTY.

The laws of Maryland relating to oyster culture provide that "no person shall be permitted, by lease, assignment, or in any other manner, to acquire a greater amount of land than ten acres situated within the territorial limits of any of the counties, or one hundred acres in any other place."

The boundary line[b] between the waters "within the territorial limits" of Charles County and the waters in "any other place," as established by the Shell Fish Commission for the purpose of carrying out the oyster laws, and delineated on the "oyster" charts and the smooth projections of the Coast and Geodetic Survey, is technically described and defined as follows:

Patuxent River waters of Charles County.—Following the boundary line between Charles County and Prince Georges County along the middle of Swanson Creek as laid down on "Chart No. 26, Natural Oyster Bars, Maryland," to a point defined by the intersection of this boundary line with the boundary line of Calvert County in Patuxent River; thence along the boundary line between Calvert and Charles counties in Patuxent River as laid down on "Chart No. 26, Natural Oyster Bars, Maryland," to a point defined by the intersection of this boundary line with the boundary line between Charles and St. Marys counties off the entrance to Indian Creek; thence along the boundary line between Charles and St. Marys counties in the middle of Indian Creek as laid down on "Chart No. 26, Natural Oyster Bars, Maryland."

Wicomico River waters of Charles County.—Following the boundary line between Charles County and St. Marys County along the middle of Wicomico River as laid down on "Chart No. 26, Natural Oyster Bars, Maryland," from the upper end of Wicomico River, as shown on said chart, to a point at the mouth of Wicomico River defined by the intersection of this boundary line with the straight line between the center point of Cobb Point Bar Light defined by latitude 38° 14′ 33.3″ and longitude 76° 49′ 36.9″ and a point on the northwest end of St. Catherine Island defined by latitude 38° 14′ 28.9″ and longitude 76° 48′ 10.9″; thence along a straight line dividing the "waters within territorial limits of county" and the "waters of Potomac River under joint jurisdiction of Maryland and Virginia as to fisheries" to the center point of Cobb Point Bar Light defined by latitude 38° 14′ 33.3″ and longitude 76° 49′ 36.9″; thence along a line following Cobb Point Bar, as laid down on "Chart No. 26, Natural Oyster Bars, Maryland," to a point located on Cobb Point defined by latitude 38° 15′ 17.5″ and longitude 76° 50′ 33.4″; thence along the mean low water line of the Maryland shore of Potomac River or a line across the mouth of all inlets less than 100 yards in width, as the case may be, and then continuing along the Maryland shore of Potomac River, crossing the mouth of Potomac River entrances of Neals Sound, around Swan Point, and crossing the mouth of Cuckold Creek and all other creeks, bays, and inlets of Potomac River under the sole jurisdiction of Maryland, to the intersection of this line with the boundary line between Charles County and Prince Georges County.[c]

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[a] For a complete historical and legal description of the boundaries of the counties of Maryland, the valuable publication entitled "The Counties of Maryland—Their Origin, Boundaries, and Election Districts," prepared by Dr. Edward B. Mathews and published by the Maryland Geological Survey under the direction of Dr. William Bullock Clark, Superintendent, should be consulted, as the boundaries described in this publication have been established and technically defined for the purpose of carrying out the oyster laws of the State, and may or may not be correct for other purposes.

[b] See "Charts of Natural Oyster Bars," published by the Coast and Geodetic Survey, and the progress map at the end of this publication.

[c] Latitudes and longitudes based on the United States standard datum of the United States Coast and Geodetic Survey.

WATERS CONTIGUOUS TO COUNTY.

The oyster laws of Maryland provide that a true and accurate delineation of all natural oyster bars shall be made on copies of charts of the United States Coast and Geodetic Survey, "which said copies shall be filed in the office of the said Commissioners in the city of Baltimore," and "in the office of the clerks of the circuit courts for the respective counties wherein the grounds so designated may lie."

For the purpose of carrying out the latter part of this section of the law and for the purpose of establishing the limits of the oyster-culture area to be opened up for leasing with each county surveyed, it is necessary for the Shell Fish Commission to establish a boundary line between the waters contiguous to but not within the territorial limits of each county and the waters contiguous to but not within the territorial limits of adjacent counties.

This boundary line has been delineated on the "Charts of Natural Oyster Bars," published by the Coast and Geodetic Survey, and is technically described and defined as follows:

Commencing at a point located at the mouth and near the middle of Wicomico River defined by the intersection of the boundary line between Charles County and St. Marys County as laid down on "Chart No. 26, Natural Oyster Bars, Maryland," and the straight line between the center point of Cobb Point Bar Light defined by latitude 38° 14′ 33.3″ and longitude 76° 49′ 36.9″ and a point on the northwest end of St. Catherine Island defined by latitude 38° 14′ 28.9″ and longitude 76° 48′ 10.9″; thence along a straight line dividing the "waters within territorial limits of county" and the "waters of Potomac River under joint jurisdiction of Maryland and Virginia as to fisheries" to the center point of Cobb Point Bar Light defined by latitude 38° 14′ 33.3″ and longitude 76° 49′ 36.9″; thence along a line following Cobb Point Bar as laid down on "Chart No. 26, Natural Oyster Bars, Maryland," to a point located on Cobb Point defined by latitude 38° 15′ 17.5″ and longitude 76° 50′ 33.4″; thence along the Maryland shore of the Potomac River across the entrances to Neals Sound, Cuckold Creek, and all other sounds, bays, creeks, or inlets under the sole jurisdiction of Maryland as to fisheries, to the intersection of this line with the boundary line between Charles County and Prince Georges County.[a]

[a] Latitudes and longitudes based on the United States standard datum of the United States Coast and Geodetic Survey.

LANDMARKS (U. S. COAST AND GEODETIC SURVEY TRIANGULATION STATIONS).

EXPLANATION.

The oyster laws of Maryland authorizing the survey to be made by the Shell Fish Commission provide for "an accurate report of said survey, setting forth such a description of landmarks as may be necessary to enable the said board, or their successors, to find and ascertain the boundary lines of said natural oyster beds, bars, and rocks, as shown by delineation on the maps and charts." The law of the United States authorizing the cooperation of the Department of Commerce and Labor in the survey of natural oyster bars of Maryland provides for the erection of "such structures as may be necessary to mark the points of triangulation, so that the same may be used for such future work of the Coast and Geodetic Survey as the said Bureau may be hereafter required to perform in prosecuting the Government coast survey of the navigable waters of the United States located within the State of Maryland."

Under the provisions of the sections of the laws stated above, the markings and descriptions of landmarks must be sufficient for the present and future needs of both the Government and the State. With this end in view, considerable work has been expended in erecting permanent monuments at the triangulation stations and in the proper description of their location.

An effort has been made to arrange the descriptions of location and character of landmarks in a uniform and logical manner. The descriptions start with the assumption that the individual seeking a landmark has only an indefinite idea of its location. They gradually proceed from description of the general locality of a landmark to the descriptions of its immediate surroundings. This is followed by specific details of the character of the center and reference marks and a "round" of reference angles and distances which in themselves frequently contain enough information to furnish an independent and reliable location of the triangulation station.

METHOD OF DESCRIBING TRIANGULATION STATIONS.

The separate descriptions of triangulation stations should not be used without reading the following explanation of the method of describing the triangulation stations, as it contains certain details that are common to all the landmarks described in this publication and which are omitted in the separate descriptions as being needless repetitions:

Name.—The title at the top of each separate description is the name by which the landmark or triangulation station is known and designated in all work and published oyster records or oyster charts of both the Government and State. The selection of the name is usually left to the triangulator establishing the station, and it may or may not have geographic or other significance in reference to the locality.

General locality.—Under this heading is given the general locality of the landmark in reference to well-known and prominent natural or artificial features, such as the nearest body of water, town, river, steamer wharf, well-defined point of land, church, or any other feature that is likely to remain both permanent and prominent.

This heading also covers a reference to the published chart or map which shows the location of the station most clearly. Nearly all the triangulation stations described in this publication are plainly indicated by name and a triangulation symbol on the published charts of oyster bars of Maryland. In this case they are referred to by serial number only, the words "charts of oyster bars of Maryland" being omitted to avoid needless repetition. These published oyster charts are on the large scale of 1 part in 20,000 (approximately $3\frac{1}{6}$ inches to a statute mile) and show the location of the triangulation stations so clearly that in many cases the written descriptions will not be required to find them.

Immediate locality.—Under this heading is given the description of the "observed station" in reference to its immediate surroundings. This is supposed to include a statement of the station's estimated elevation above high water or some other well-defined level of the locality, such as a road or house; the character of the ground on which it is located, such as marsh land, sand beach, cultivated field, or meadow; estimated bearings in points of the compass and estimated distances in yards *from* (*not to*) easily recognized features, such as extreme end of point, edge of bluff, bank of creek, line of telephone poles, shore line, barn, house, fence, ditch, trees, or any other definite detail, such as being on range with the tangent of an island and a church; and so forth.

When a standard monument has been established near the station as a "reference station," this heading also covers a statement of the true bearing of the monument in degrees and minutes and its measured distance in meters, as it is the first object that is likely to catch the eye when the immediate vicinity of the desired station is reached and might be mistaken for the center mark of the "observed station" unless special attention is called to it.

The distinction between the "observed station" and "reference station" should be carefully noted by anyone making use of the description of stations for any future surveying operations.

The "observed station" is located at the particular triangulation point covered by the description of stations, and is the one whose geographic position is first computed, as it is the point which was "occupied" and "observed on" for horizontal angles. However, in spite of the primary importance of the location of the "observed station," it will be noted from the description of stations that frequently it is not marked as well as the "reference station," and in many instances has only a pine stub to indicate its position. This is the case for the reason that the necessity of intervisibility of landmarks usually made it compulsory to locate "observed stations" on edges of banks and ends of points of land, which in the tide-water section of Maryland generally means they will be washed away in a short period of years. The past experience of the Coast and Geodetic Survey in this region has shown the great need of "reference stations," if the frequent reestablishment of a new framework of triangulation is to be avoided.

The chief reason and need for the establishment of the "reference station," or secondary station, as it might be well named, is explained in the preceding paragraph, but in several instances other reasons, such as the location of the "observed station"

on an unstable sand dune, in a cultivated field, in front of a residence, or other places objectionable to the landowner, have led to establishment of "reference stations." The location of the "reference station" in relation to the "observed station" is fixed for plotting on charts or for computation of its geographic position by checked measurements of its distances and azimuth from the "observed station."[a]

Marks.—Under this heading is given a description of the character of the permanent monuments or other marks of the location of the "observed station," and of the "reference station" where one has been established.

All the marks designated in the descriptions as "the center point of triangle on standard cement monument" are exactly alike. These monuments are made of cement, sand, and gravel, and are 2 feet long and 8 inches square at top and bottom. Their tops are all marked with the same brass mold and show a center hole surrounded by a triangle, with the letters "M. S. F. C." arranged around the vertex and the letters "U. S. C. S." underneath the base of the triangle. The center hole is always in the center of the top of the monument by construction, and if this is found to have been broken off without disturbing the bottom the center of its square section can be used as the location of the station.

All the "standard cement monuments," whether used for marking the "observed station" or "reference station," have been planted upright in exactly the same manner, with their tops projecting 3 or 4 inches above the surface of the ground, unless otherwise stated.

Therefore, as the above facts in reference to the "standard cement monuments" are a constant element in all cases, the repetition of these facts in the description of stations is made needless by this one statement.

References.—Under this heading are given the "rounds" of directions and distances to all objects that might be useful in locating the stations when the surface marks can not be found. It is also contemplated that for general purposes of topography, hydrography, or location of boundaries of oyster bars these references will be sufficient in many cases to relocate the position of an "observed station" or "reference station" when both of them have been destroyed.

The first reference object given in the descriptions is always a triangulation station visible from the station being described, this, if possible, being a light-house, church spire, or other permanent and prominent point. Its direction is taken as being 0° 00′ 00″, and the directions of all other objects are measured from it as an initial point, the angles being taken in a clockwise direction (left to right).

The true bearing[b] of the initial object is always given in parentheses alongside its name. This furnishes means for the calculation of the bearings of any of the other reference objects for the purposes of locating a station by horizontal angles or for the relocation of corner buoys of oyster-bar boundaries by the method of compass directions described in this publication under the heading of "Boundaries of oyster bars."

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[a] Geographic coordinates (latitude, longitude, distance, and azimuth) relating to any of the "observed stations" or of the "reference stations" described in this publication can be obtained by application to the Superintendent of the Coast and Geodetic Survey, at Washington, D. C.

[b] The mean magnetic variation for Charles County was 5° 20′ west of north in 1910 and increasing at the rate of 4′ yearly.

The distances in the last column under "References" are given in three different units, which vary according to their accuracy. The "miles" are statute miles and may be considered only as rough estimates. The "yards" are more accurate, but must be looked on as results generally obtained by pacing or careful estimating. The "meters," however, are accurate to the degree indicated by their decimals and in every case have been measured with a steel tape. In the same manner the accuracy of the directions are indicated by the refinement of angular measure with which they are recorded.

DESCRIPTIONS OF TRIANGULATION STATIONS.

BARBER.

General locality.—Northeastern shore of Wicomico River about ¾ mile north-northeast of Stoddard Point. (See Chart No. 26.)

Immediate locality.—Observed station is on grass land about 2 feet above high-water mark, 3 yards north of shore, 20 yards west of trees which extend inland along creek, 4 yards southwest by west of a corner of a fence and 15 yards southeast of another corner of a fence.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Stoddard" (S 9° 46′ W)	0	00	00	1⅛ miles.
Left chimney of Stoddard house	3	27	..	1⅛ miles.
Near peak of roof between two chimneys	45	15	..	1½ miles.
Chimney on left end of small house	62	54	..	1½ miles.
Nail in blaze in top fence rail	136	06	..	10.62 meters.
Nail in blaze in cedar tree (5 inches diameter)	155	29	..	10.75 meters.
Nail in blaze in top of chestnut fence post	245	24	..	3.43 meters.
Nail in blaze in persimmon tree (5 inches diameter)	259	16	..	13.94 meters.
Tangent of point	299	13	..	¼ mile.
Near large chimney of negro quarters	302	07	..	1⅛ miles.

UPPER.

General locality.—Southwestern shore of Wicomico River on Stoddard Point (upper point) about 2¼ miles north-northwest of Mills Point. (See Chart No. 26.)

Immediate locality.—Observed station is on a long narrow point about 2 feet above high-water mark, 5 yards south of side of point, 8 yards northwest of side of point, 38 yards west of high-water mark on middle of point and 138 yards west by north of high-water mark on extreme end of point.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Stoddard" (S 27° 38′ E)	0	00	00	½ mile.
Right chimney of Stoddard house	9	12	..	½ mile.
Left peak of roof of barn	33	02	..	½ mile.
Left chimney of old house	49	29	..	½ mile.
Tangent of next point	141	07	..	⅝ mile.
Right chimney of house on ridge	179	15	..	3 miles.
Chimney outside small house on opposite shore	213	28	..	1¼ miles.
Near corner post of piazza of large house	247	47	..	1⅝ miles.
Chimney top of Key house	296	04	..	1½ miles.

KEY.

General locality.—Northeastern shore of Wicomico River on a high bluff about 1 mile north of Cohouck Point. (See Chart No. 26.)

Immediate locality.—Observed station is about 30 feet above high-water mark in an orchard, about 24 yards northeast of edge of bank, 49 yards north of edge of bank, 15 yards east of edge of bank, 130 yards south-southwest of negro quarters and 130 yards west of fence which incloses an orchard.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″	
"Stoddard" (S 70° 48′ W)	0	00	00	1⅛ miles.
Near corner of near chimney on Stoddard house	0	29		1¼ miles.
Near corner of near chimney of small house	15	05		1⅜ miles.
Peak of roof between two chimneys on house	17	13		2 miles.
Peak of roof of very large barn	56	52		3 miles.
Chimney on middle of roof on two-story house	62	06		3 miles.
Near corner of near chimney of negro's quarters	116	54		130 yards.
Nail in blaze in apple tree (12 inches diameter)	135	58		22.15 meters.
Chimney of Key house	164	37		¼ mile.
Nail in blaze in apple tree (14 inches diameter)	168	57		13.39 meters.
Peak of roof of large barn	259	16		½ mile.
Nail in blaze in apple tree (12 inches diameter)	281	25		7.94 meters.
Peak of roof of house on piles	347	23		1⅝ miles.
Between two chimneys of large brick house on hill	357	45		2½ miles.

STODDARD.

General locality.—Western shore of Wicomico River about ½ mile south-southeast of Stoddard Point and 1 mile west-northwest of Cohouck Point. (See Chart No. 26.)

Immediate locality.—Observed station is on gravel, grass, and shell point, near a lone gum tree, about 2 feet above high-water mark, 6 yards south-southwest of side of point, 6 yards north of side of point, 10 yards west of extreme end of point and 158 yards east-northeast of Stoddard house.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″	
"Upper" (N 26° 37′ W)	0	00	00	½ mile.
Outside chimney of small house	23	08		1½ miles.
Peak of front gable of large house on ridge	52	54		1⅞ miles.
Chimney on top of Key house	94	47		1½ miles.
Chimney outside of two and a half story house	153	58		2⅜ miles.
Right chimney of large house	172	38		2 miles.
Peak of roof of house on Chaptico Wharf	180	10		2⅝ miles.
Chimney top of house on piles	228	37		½ mile.
Near corner of chimney on Stoddard house	284	44		158 yards.
Nail in blaze in pear tree (24 inches diameter)	315	20		4.58 meters.
Nail in blaze in pear tree (4 inches diameter)	349	47		9.41 meters.

COHOUCK.

General locality.—Eastern shore of Wicomico River on Cohouck Point on the northern side of entrance to Chaptico Bay. (See Chart No. 26.)

Immediate locality.—Observed station is on Cohouck Point, about 6 feet above high-water mark, 12 yards east of edge of bank, 35 yards south of edge of bank, 85 yards northeast of extreme point and about 25 yards north of marsh.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″	
"Key" (N 3° 29′ E)	0	00	00	⅞ mile.
Nearest chimney on negro quarters	0	27		1 mile.
Near peak of roof of barn	26	38		1 mile.
Chimney outside near end of two and a half story house	128	58		¾ mile.
Right chimney of Lyon house near Mills Point	171	29		1⅛ miles.
Chimney on flat roof house near mouth of Bowmans Creek	226	56		2 miles.
Chimney on far end of house	261	43		1⅜ miles.
Chimney on house on piles	270	53		1⅛ miles.
Peak of front gable of house on ridge	352	51		2¼ miles.

HAYDEN.

General locality.—Western shore of the Wicomico River about 1⅛ miles west of Cohouck Point. (See Chart No. 26.)

Immediate locality.—Observed station is surrounded by water bushes on marshy land, about 1 foot above high water, 5 yards northwest of shore and 17 yards southeast of line of trees on top of bank. Cement monument marking reference station is 11.50 meters N 54° 34′ W of observed station.

Marks.—Observed station is nail in stub with top 3 inches above ground. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Fact" (S 41° 35′ E)	0	00	00	1⅜ miles.
Between two main chimneys of large house below Chaptico Wharf	5	11	..	2⅜ miles.
West roof peak of house on Chaptico Wharf	6	51	..	2¼ miles.
Chimney on middle of square house	65	06	..	⅝ mile.
Nail in blaze in cedar tree (18 inches diameter)	124	14	..	23.45 meters.
Nail in blaze in locust tree (8 inches diameter)	155	23	..	16.55 meters.
REFERENCE STATION	167	01	20	11.51 meters.
Nail in blaze in oak tree (8 inches diameter)	213	29	..	18.74 meters.
Chimney on Key house	275	45	..	1¾ miles.
Chimney of Maddox house	344	28	..	3¼ miles.
Right chimney outside of old house	354	31	..	1⅝ miles.

PERRY.

General locality.—Southeastern shore of Chaptico Bay, about 1 mile northeast of Mills Point and ⅝ mile southeast of Cohouck Point. (See Chart No. 26.)

Immediate locality.—Observed station is in an open field, about 20 feet above high-water mark, 8 yards northwest of edge of bank, 9 yards south-southwest from edge of gully in bank, 5 yards south of edge of bank of gully, and about 150 yards north-northeast of creek.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Fact" (S 51° 10′ W)	0	00	00	1 mile.
Chimney on right end of house	5	41	..	2⅜ miles.
Chimney on flat-roof house	15	03	..	2½ miles.
Left chimney of Crane house	31	37	..	3⅝ miles.
Nail in blaze in locust tree (3 inches diameter)	42	34	..	10.49 meters.
Nearest chimney on larger part of double brick house	42	50	..	3⅝ miles.
Left chimney of house on piles	55	28	..	1¾ miles.
Near peak of roof on house	62	53	..	2 miles.
Near corner of near chimney of Stoddard house	66	59	..	2 miles.
Nail in blaze in locust tree (3 inches diameter)	81	40	..	8.44 meters.
Peak of front gable of house on ridge	113	51	..	3 to 4 miles.
Nail in blaze in locust tree (8 inches diameter)	136	40	..	5.95 meters.
Near chimney of large house on ridge	169	08	..	1⅝ miles.
Chimney outside of two-and-a-half-story house	289	15	..	150 yards.

BURR.

General locality.—Western shore of Wicomico River directly opposite mouth of Chaptico Bay and ¾ mile north of Bowmans Creek. (See Chart No. 26.)

Immediate locality.—Observed station is on hard ground between a sloping bank 10 feet high covered with trees and a marshy shore, about 2 feet above high-water mark, 18 yards northwest of extreme point, 23 yards north of shore, 17 yards southwest of shore, and 9 yards southeast of bottom of bank.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Fact" (S 65° 59′ E)	0	00	00	1¼ miles.
Between two chimneys of large house on ridge	16	39	..	4¾ miles.
West end of peak of roof of house on Chaptico Wharf	17	15	..	2⅛ miles.
Right chimney of two-and-a-half-story house	72	21	..	1¼ miles.
Chimney in middle of large house	88	21	..	1⅛ miles.
Nail in blaze in persimmon tree (11 inches diameter)	97	25	..	7.67 meters.
Nail in blaze in persimmon tree (9 inches diameter)	192	56	..	2.60 meters.
Nail in blaze in persimmon tree (10 inches diameter)	236	32	..	3.86 meters.
Main chimney of Key house	293	03	..	2¼ miles.
Chimney on Maddox house	358	28	..	3⅛ miles.

FACT.

General locality.—Eastern shore of Wicomico River on Mills Point on south side of mouth of Chaptico Bay. (See Chart No. 26.)

Immediate locality.—Observed station is on a long point covered on the southern side with gum and cedar trees, about 10 feet above high-water mark, 23 yards from extreme end of top of bank, 6 yards north of edge of bank, and 8 yards southeast of edge of bank.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Cobb Point Bar Light" (S 7° 13′ E)	0	00	00	6½ miles.
Nail in blaze in cedar tree (7 inches diameter)	5	07	..	6.20 meters.
Nail in blaze in oak tree (28 inches diameter)	56	16	..	6.37 meters.
Chimney on ell end of Stoddard house	157	08	..	1⅞ miles.
Chimney on Key house	199	54	..	2⅛ miles.
Near peak of roof of large house	274	25	..	¼ mile.
Nail in blaze in cedar tree (6 inches diameter)	301	45	..	16.26 meters.
Near chimney of large house near shore	317	53	..	⅝ mile.
West end of peak of house on Chaptico Wharf	342	53	..	⅞ mile.

BOWMAN.

General locality.—Western shore of Wicomico River at northeast side of mouth of Bowmans Creek and 1½ miles west by south of Mills Point. (See Chart No. 26.)

Immediate locality.—Observed station is surrounded by water bushes on point of land about 1½ feet above high water, 14 yards east of high-water mark, 16 yards north of extreme end of point, 20 yards northeast of side of point, 20 yards south of several cedar trees, and about 150 yards south of a house.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Sacred Heart Church Spire" (S 62° 50′ E)	0	00	00	4⅝ miles.
Chimney on end of long house	10	37	..	3¼ miles.
Chimney of Lyon house	13	56	..	3¼ miles.
Nail in blaze in cedar tree (7 inches diameter)	59	04	40	8.88 meters.
Chimney on square house	76	25	..	¼ mile.
Crane house	168	10	..	2 miles.
Nail in blaze in cedar tree (6 inches diameter)	216	10	00	18.37 meters.
Nail in blaze in cedar tree (7 inches diameter)	232	40	30	17.58 meters.
Chimney on near end of house	263	40	..	½ mile.
Peak of roof between two chimneys	357	27	..	2¼ miles.

EEDLING.

General locality.—Western shore of Wicomico River about 1¼ miles southwest of Mills Point and about 1 mile southeast of mouth of Bowmans Creek. (See Chart No. 26.)

Immediate locality.—Observed station is in a shell-covered cultivated field, about 10 feet above high-water mark, 37 yards southwest of shell and gravel beach, 88 yards west-northwest of extreme end of point, and 70 yards north of a ditch in marsh. Cement monument marking reference station is 23.99 meters N 89° 56′ W of observed station.

Marks.—Observed and reference stations are marked by the center point of the triangles on standard cement monuments.

References.—

	°	′	″	
"Fact" (S 39° 15′ W)	0	00	00	1¼ miles.
Nail in blaze in gum tree (20 inches diameter)	2	07	50	26.06 meters.
Near peak of roof of house on Chaptico Wharf	42	05	..	1⅜ miles.
Chimney outside near end of house on hill	44	24	..	2⅝ miles.
Nail in blaze in cedar tree (3 inches diameter)	49	54	40	25.75 meters.
REFERENCE STATION	50	48	55	23.99 meters.
Chimney on right of ell of a house	60	12	..	2 miles.
Near peak of roof of Eedling house	265	55	..	⅜ mile.
Nail in blaze in oak tree (24 inches diameter)	331	27	40	33.99 meters.

FARR.

General locality.—Eastern shore of Wicomico River about 1¼ miles south-southeast of Mills Point and ¼ mile north of the mouth of Manahowick Creek. (See Chart No. 26.)

Immediate locality.—Observed station is about 10 feet above high-water mark, 5 yards east by south of edge of bank, 32 yards north-northwest of several pine trees at fish shanty near edge of bank, 22 yards south by east of other trees, and 300 yards west by north of a large house.

Marks.—Observed station is center point of triangle on standard cement monument buried 16 inches below surface of ground with nail in stub at surface.

References.—

	°	′	″	
"Cobb Point Bar Light" (S 2° 35′ E)	0	00	00	5¼ miles.
"Rock Point Catholic Church Cross"	8	03	40	3¼ miles.
Chimney on left side of house	42	41	..	1¾ miles.
Left chimney of Crane house	113	40	..	4½ miles.
Left peak of house on Chaptico Wharf	153	08	..	½ mile.
Left chimney of house on Mills Point farm	168	34	..	1¼ miles.
Right chimney on Maddox house	242	28	..	2 miles.
Right corner of large house	292	33	..	¼ mile.
Near corner of fish shanty	338	27	..	23.69 meters.

GUST.

General locality.—Western shore of Wicomico River on Windmill Point about ¾ mile north of the mouth of Hedneys Creek and opposite mouth of Manahowic Creek. (See Chart No. 26.)

Immediate locality.—Observed station is on shell and gravel point, bordered by persimmon and cedar trees, about 2 feet above high-water mark, 12 yards northwest of shore, 16 yards south of shore, and 28 yards west-southwest of shore on extreme end of point.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Fact" (N 20° 09′ E)	0	00	00	1¼ miles.
Nail in blaze in persimmon tree (8 inches diameter)	6	22	..	7.95 meters.
Near peak of roof of house on Chaptico Wharf	35	32	..	1¼ miles.
Chimney on left side of large house	58	18	..	1⅜ miles.
Chimney on middle of Lyon house	101	24	..	1¾ miles.
Near peak of roof of house with two chimneys	171	43	..	⅝ mile.
Nail in blaze in cedar tree (4 inches diameter)	204	14	00	5.90 meters.
Nail in blaze in cedar tree (10 inches diameter)	301	03	10	16.18 meters.

LYON.

General locality.—Eastern shore of Wicomico River on a point about ¼ mile north of Bramleigh Creek and 2 miles north by east of Rock Point. (See Chart No. 26.)

Immediate locality.—Observed station is on a point of land between the Lyon residence and edge of bank, 100 yards north of small pond which is fringed on river side with cedar trees, about 4 yards north of a bird house on a post, 19 yards east-northeast of most prominent point of bank, 15 yards east-southeast of side of bank, 16 yards north-northeast of another side, and 12 yards south-southwest of a fence.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Weiss" (S 25° 47′ E)	0	00	00	.....	1¼ miles.
Nail in blaze in cedar post of bird house support	51	15	20		3.67 meters.
Nail in blaze in pear tree (6 inches diameter)	58	00	50	.....	11.74 meters.
Chimney of house	129	14			1⅝ miles.
Left chimney of Crane house	148	52	..	.....	5¼ miles.
Between two chimneys of large brick house	159	59	..	.....	3½ miles.
Near peak of roof between two chimneys of large house	171	56	..	.....	3¾ miles.
West end of peak of roof of house on Chaptico Wharf	186	23	..	.....	1¾ miles.
Corner of fence	198	08	..	.....	14.15 meters.
Near corner of house	247	11			22.01 meters.
Right corner of small house	295	38	..	.....	24.59 meters.
Nail in blaze in locust tree (4 inches diameter)	302	02	10	.....	8.82 meters.
Right corner of shed	336	36	..	.....	14.98 meters.

SACRED HEART CHURCH SPIRE (BUSHWOOD).

General locality.—Easterly side of Wicomico River on high land about 1½ miles inland, north by east of Bushwood Wharf. (See Chart No. 26.)

Immediate locality.—Observed station is steeple of Sacred Heart Church near Bushwood.

Marks.—Observed station is center of cross on steeple.

References.—None necessary.

HEDNEY.

General locality.—Western shore of Wicomico River on first point above mouth of Charleston Creek and about 1¾ miles northwest of White Point. (See Chart No. 26.)

Immediate locality.—Observed station is about 25 feet above high-water mark, 16 yards west-southwest of edge of bank, 139 yards north of large tree at edge of bank, 85 yards north of oak tree at edge of bank, 155 yards east-northeast of gum tree 20 inches diameter on bank of a pond, and about ⅛ mile east-southeast of a house among trees.

Marks.—Observed station is center point of triangle on standard cement monument with top buried 12 inches below the surface of the ground. Surface mark is nail in stub with top 5 inches above surface of ground.

References.—

	°	′	″		
"Sacred Heart Church Spire" (N 86° 31′ E)	0	00	00	.....	4½ miles.
Near corner of nearest chimney of four on a large house on hill	7	11	..	.....	4½ miles.
Right chimney of a large house	13	03	..	.....	2 miles.
Middle of island at end of White Point Bar	38	45	..	.....	1⅞ miles.
Nail in blaze in oak tree (48 inches diameter)	50	28	00	.....	73.16 meters.
Nail in blaze in walnut tree (36 inches diameter)	84	52	30		115.03 meters.
Middle of gum tree	147	46	30	.....	138.47 meters.
Near peak of roof between two chimneys	239	48	..	.....	¾ mile.
Near chimney on large house	312	19	..	.....	1⅝ miles.
Chimney of Lyon house	352	40	..	.....	1⅛ miles.

CHARLES.

General locality.—Western shore of Wicomico River on first point south of entrance to Charleston Creek, and 1¼ miles north of Rock Point. (See Chart No. 26.)

Immediate locality.—Observed station is on a small marshy point about 6 inches above high-water mark and 18 yards east of pine woods on a bank 10 feet above high water. Cement monument marking reference station is 15.56 meters N 57° 10′ W of observed station.

Marks.—Observed station is nail in stub with top 2 inches above ground. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Hard" (S 17° 38′ E)	0	00	00	1¼ miles.
Nail in blaze in pine tree (10 inches diameter)	47	51	..	28.46 meters.
Nail in blaze in pine tree (12 inches diameter)	84	58	..	16.66 meters.
Nail in blaze in pine tree (7 inches diameter)	134	22	..	16.87 meters.
REFERENCE STATION	138	28	10	15.56 meters.
West chimney on two-story house	265	53	..	1¼ miles.
"Sacred Heart Church Spire (Bushwood)"	268	03	50	2¾ miles.
West chimney on Garner house	293	51	..	1¾ miles.
West gable of house on Bushwood Wharf	300	07	..	2 miles.

WEISS.

General locality.—Eastern shore of Wicomico River on White Point, about 3 miles north by east of Cobb Point Bar Light. (See Chart No. 26.)

Immediate locality.—Observed station is on a bluff near small cedar trees, about 8 feet above high-water mark, 13 yards north of and 27 yards south of edges of bluff and 52 yards east of extreme point.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Cobb Point Bar Light" (S 11° 43′ W)	0	00	00	3⅛ miles.
Flagstaff on schoolhouse	40	41	20	1⅝ miles.
Nail in blaze in cedar tree (10 inches diameter)	54	03	10	42.29 meters.
Left chimney on two-story house	155	26	..	¾ mile.
Nail in blaze in poplar tree (3 inches diameter)	181	46	..	6.24 meters.
"Sacred Heart Church Spire"	216	56	30	1¾ miles.
West chimney of Garner house	260	27	..	⅝ mile.
Nail in blaze in poplar tree (4 inches diameter)	266	27	50	37.80 meters.
West gable of house on Bushwood Wharf	284	26	..	⅝ mile.
Left chimney on two-story house	342	10	..	2⅜ miles.

BLAKISTONE.

General locality.—Eastern shore of Wicomico River, about ¼ mile southeast of Plowdens Wharf at Bushwood, and about 3 miles north-northeast of Cobb Point Bar Light. (See Chart No. 26.)

Immediate locality.—Observed station is on second bluff southeast of Bushwood Wharf, 15 feet above high-water mark, 15 yards southeast of a large dogwood tree, about 6 yards northeast of edge of bluff, 3 yards southwest of rail fence, about 15 yards southwest of an ice house near orchard, and 5 to 10 yards south to east of several small cedar trees.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Prec" (S 18° 42′ W)	0	00	00	2 miles.
"Rock Point Catholic Church Cross"	51	28	30	2 miles.
Left peak of roof of wharf house	94	16	..	1⅞ miles.
Large tree	117	48	..	13.36 meters.
Chimney of Blakistone store	125	48	..	¼ mile.
Near peak of roof of Blakistone house	176	32	..	250 yards.
Point of cupola on Ranahan house	191	45	..	1¾ miles.
Near left corner of sill of ice house	233	15	..	14.15 meters.
Right lower corner	260	33	..	15.76 meters.
Near peak of roof	312	54	..	¼ mile.

HARD.

General locality.—Western shore of Wicomico River on point of land known as Rock Point about 2 miles north by west of Cobb Point Bar Light. (See Chart No. 26.)

Immediate locality.—Observed station is on low point of land near several small cedar trees about 1 foot above high-water mark, 47 yards west of shore, 16 yards south of shore, 30 yards north of shore, about 80 yards northeast by north of Rock Point Wharf, and 170 yards northeast by east of Lancasters store.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Cobb Point Bar Light" (S 10° 17′ E)	0	00	00	2 miles.
Northeast gable of wharf house	41	07	..	80 yards.
"Rock Point Catholic Church Cross"	70	16	20	¼ mile.
South chimney on Lancaster store	88	53	..	170 yards.
Point of east gable on house	134	44	..	¼ mile.
"Sacred Heart Church Spire"	239	04	20	3 miles.
Gable of house on wharf at Bushwood	256	00	..	1¾ miles.
West gable of house	293	06	..	2 miles.
West gable on one-story house	315	19	..	2¼ miles.
North chimney of two-story house	330	12	..	2½ miles.

ROCK POINT CATHOLIC CHURCH CROSS.

General locality.—Eastern shore of Wicomico River at Rock Point. (See Chart No. 26.)

Immediate locality.—Observed station is in settlement called Rock Point. It is on the larger of two similar buildings, the smaller one being the schoolhouse.

Marks.—Observed station is center point of cross on Rock Point Catholic Church.

References.—None necessary.

PREC.

General locality.—Eastern shore of Wicomico River on Bluff Point about 2 miles north-northeast of Cobb Point Bar Light. (See Chart No. 26.)

Immediate locality.—Observed station is about 10 feet above high-water mark, 34 yards southeast of nearest end of neck of Bluff Point, 29 yards south-southeast of shore, 16 yards northeast of shore, and 88 yards west by southwest of house.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Cobb Point Bar Light" (S 28° 37′ W)	0	00	00	2 miles.
Tangent of woods on Cobb Point	34	04	..	2 miles.
"Rock Point Catholic Church Cross"	70	16	30	1⅝ miles.
Nail in blaze in locust tree (3 inches diameter)	116	14	40	20.64 meters.
Left chimney of Garner house	148	42	..	1⅛ miles.
Nail in blaze in left one of twin locust trees (12 inches diameter)	153	38	20	30.36 meters.
"Sacred Heart Church Spire"	172	15	10	2¾ miles.
Near chimney of Sherrer house	228	37	..	88 yards.
Nail in blaze in poplar tree (6 inches diameter)	243	01	50	33.74 meters.
Nail in blaze in poplar tree (5 inches diameter)	282	00	40	27.71 meters.
Left chimney of cottage	298	22	..	⅛ mile.
Right chimney of Bailey house on St. Margarets Island	336	25	..	1½ miles.

CORNER.

General locality.—Western shore of Wicomico River on the eastern side of an island known as Cobb Point Neck about halfway between Cobb Point and the entrance to Neales Sound. (See Chart No. 26.)

Immediate locality.—Observed station is in a cultivated field on a bluff bordered with pine trees about 15 feet above high-water mark, 3 yards west of a wire fence running along edge of bluff and 21 yards east-northeast of a wire fence which separates cornfield from pine woods.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Cobb Point Bar Light" (S 29° 39′ E)	0	00	00	1⅜ miles.
Nail in blaze in cedar tree (3 inches diameter)	50	02	..	16.98 meters.
Nail in blaze in pine tree (8 inches diameter)	111	43	..	21.41 meters.
Nail in blaze in pine tree (12 inches diameter)	135	20	..	33.22 meters.
Middle chimney of house	177	07	..	¼ mile.
"Catholic Church Cross"	217	16	10	⅞ mile.
Left chimney of house on St. Margarets Island	318	56	..	1⅝ miles.

ST. MARGARET 2.

General locality.—Northwestern side of Potomac River on the southwestern side of St. Margarets Island in the mouth of the Wicomico River about 1 mile northeast of Cobb Point Bar Light. (See Chart No. 26.)

Immediate locality.—Observed station is on a bluff about 12 feet above high-water mark, 15 inches northeast of edge of bluff, 86 yards northwest of cow shed, 129 yards south-southwest of several houses and 154 yards west-southwest of Bailey (large) house. Cement monument marking reference station is 79.19 meters N 46° 26′ E of observed station and at corner of cow shed.

Marks.—Observed station is center of a stub in a 2½-inch tile pipe set in cement with top flush with ground. Reference station is center point of triangle of standard cement monument.

References.—

	°	′	″	
"Cobb Point Bar Light" (S 53° 22′ W)	0	00	00	1 mile.
Tangent of Cobb Point	45	18		1⅛ miles.
"Rock Point Catholic Church Cross"	83	42	50	1⅞ miles.
Chimney on left of Garner new house	129	40	..	2⅜ miles.
"Sacred Heart Church Spire"	143	27	50	4 miles.
REFERENCE STATION	173	04	15	79.19 meters.
Left chimney of Bailey house	194	51	..	150 yards.
Nearest chimney of small house on Bullock Island	220	26	..	1 mile.
Left chimney of small house on St. Catherine Island	258	32	..	1¼ miles.

COBB POINT BAR LIGHT.

General locality.—Northerly side of Potomac River at mouth of Wicomico River on the southeastern extremity of Cobb Point Bar. (See Chart No. 26.)

Immediate locality.—Observed station is on the end of Cobb Point Bar at the mouth of the Wicomico River.

Marks.—Observed station is center point of black lantern on screw pile structure known as "Cobb Point Bar Light."

References.—

	°	′	″	
"Blakiston Island Light" (S 61° 25′ E)	0	00	00	5 miles.

RIVER SPRINGS CATHOLIC CHAPEL CROSS.

General locality.—Northern side of Potomac River inland about ¾ mile north by west of River Springs. (See Chart No. 26.)

Immediate locality.—Observed station is on building known as River Springs Catholic Chapel.

Marks.—Observed station is center of cross on River Springs Catholic Chapel.

References.—None necessary.

SOUND.

General locality.—Northern shore of St. Catherine Sound about 2¼ miles east by north of Cobb Point Bar Light and ¼ mile east of Bullock Island. (See Chart No. 26.)

Immediate locality.—Observed station is about 15 feet above high-water mark, 35 yards north of edge of bank, 2 yards east of wire fence, 65 yards east of edge of bank, 57 yards south of southeast corner of fence of house yard, and 63 yards south by west of telephone pole line which is on the same side of the road.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Cobb Point Bar Light" (S 84° 53′ W)	0	00	00	2¼ miles.
Right chimney of house on Bullock Island	8	24	..	½ mile.
Near end of small chimney on large house	27	15	..	1 mile.
Left corner post of fence	65	05	..	Near.
Near corner of chimney of small house	86	25	..	Near.
Near corner post of fence	100	58	..	Near.
Right peak of roof of barn	115	20	..	Near.
"River Springs Catholic Chapel Cross"	148	31	10	1 mile.
Chimney of Blakistone store	189	16	..	½ mile.
Near chimney of Bailey house	217	59	..	½ mile.
Chimney on smaller house on St. Catherine Island	323	03	..	¾ mile.

BAILEY.

General locality.—Northeastern shore of St. Catherine Sound, about ¾ mile east by north of eastern end of St. Catherine Island and 1 mile north of the Potomac River. (See Chart No. 26.)

Immediate locality.—Observed station is on shelly ground on Bailey property, about 5 feet above high-water mark, 10 yards northeast of high-water mark, 7 yards northeast of a wire fence, 35 yards south-southeast of corner of wire fence, 30 yards north-northwest of corner of wire and wooden fences, 25 yards north of Bailey house, and 40 yards west by south of corner of wooden fence.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Cobb Point Bar Light" (N 88° 11′ W)	0	00	00	2⅝ miles.
Nail in blaze in one of four cedar trees (3 inches diameter)	13	29	..	12.37 meters.
Nail in blaze in cedar tree (8 inches diameter)	44	59	..	27.82 meters.
Corner of wire fence	46	29	..	32.06 meters.
Chimney on house	90	38	..	150 yards.
"River Springs Catholic Chapel Cross"	113	06	00	1 mile.
Corner of wooden fence	175	52	..	37.49 meters.
Chimney of Bailey house	203	26	..	25 yards.
Junction of wire and wooden fences	254	35	..	26.22 meters.
Left chimney of house on Waterloo Point	277	43	..	¾ mile.
Nail in blaze in first of six cedar trees	297	27	..	10.76 meters.
Right chimney of small house on St. Catherine Island	348	02	..	1 mile.

ST. CATHERINE.

General locality.—Southern shore of St. Catherine Sound, on the northern side of St. Catherine Island. (See Chart No. 26.)

Immediate locality.—Observed station is about 12 feet above high-water mark, 86 yards south of edge of bank, 49 yards west of line of young cedar trees, 198 yards northeast of a lone mulberry tree 3 feet in diameter, and 207 yards southeast of small house among trees.

Marks.—Observed station is center point of triangle on standard cement monument with top 12 inches below the surface.

References.—

	°	′	″	
"Cobb Point Bar Light" (N 81° 08′ W)	0	00	00	1⅞ miles.
Right side of right chimney on small house	13	04	..	207 yards.
Left chimney of large house on St. Margarets Island	34	42	..	1⅜ miles.
Right chimney of house on Bullock Island	66	01	..	½ mile.
Chimney of Blackistone house	117	39	..	⅝ mile.
"River Springs Catholic Chapel Cross"	129	17	40	1⅝ miles.
Left chimney of Bailey house	158	19	..	⅞ mile.
Right chimney of Young house on Waterloo Point	207	48	..	⅞ mile.

WATERLOO.

General locality.—Southeastern shore of St. Catherine Sound, about ¾ mile east-southeast of St. Catherine Island and about ¼ mile north of Potomac River. (See Chart No. 26.)

Immediate locality.—Observed station is at top of rise in field, about 8 feet above high-water mark, 48 yards east by south of shore at a point where several mulberry trees stand, 43 yards south of large sugarberry tree, 19 yards south by east of wire-fence post, and 200 yards north of Young house on Waterloo Farm.

Marks.—Observed station is center point of triangle on standard cement monument, with top 12 inches below surface of ground.

References.—

	°	′	″	
"Sound" (N 18° 41′ W)	0	00	00	1 mile.
Near end of peak of Blackistone barn	3	02	..	1 mile.
"Sacred Heart Church Spire (Bushwood)"	10	37	20	5 miles.
Peak of gable of Blackistone house at River Springs	21	54	..	⅞ mile.
Near peak of roof of Bailey house	31	01	..	¾ mile.
Near peak of roof of Yates house	49	13	..	½ mile.
Near peak of roof of Quaid house	71	25	..	¼ mile.
Near peak of house	92	31	..	½ mile.
Nail in blaze in apple tree (5 inches diameter)	111	20	30	34.78 meters.
Nail in blaze 8-inch branch on apple tree (14 inches diameter)	153	34	20	24.90 meters.
Nail in blaze in apple tree (6 inches diameter)	203	50	00	26.18 meters.
Near peak of roof of Young house	206	57	..	200 yards.
Left tangent of St. Catherine Island	300	21	..	¾ mile.
Right chimney of roof of house on Bullock Island	337	19	..	1⅜ miles.
Near peak of roof of house	352	57	..	1¾ miles.

PRINCE.

General locality.—Western shore of Patuxent River, about ¼ mile north of mouth of Swanson Creek. (See Chart No. 26.)

Immediate locality.—Observed station is in pasture about 20 feet above high water, 15 yards northwest of edge of bank, 75 yards northeast of a grove of trees, and 100 yards southwest of another grove of trees. Locust trees form a fringe along edge of bank.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Leitch" (S 83° 01′ E)	0	00	00	¾ mile.
Square chimney on house	0	02	..	¾ mile.
Chimney on store at Buena Vista	19	15	..	1¾ miles.
Chimney of Dr. Huggins house at Buena Vista	21	07	..	1¾ miles.
Nearest chimney on Gourley house on Hallowing Point	55	16	..	2½ miles.
Nail in blaze in locust tree (3 inches diameter)	79	38	30	15.94 meters.
Nail in blaze in locust tree (4 inches diameter)	110	13	30	14.55 meters.
Outside chimney on large house on hill	150	45	..	¾ mile.
Near end of peak of roof	226	02	..	¾ mile.
Middle of clump of trees	273	00	..	100 yards.
Chimney of house	311	04	..	1¾ miles.
Nail in blaze in crotch of locust tree (6 inches diameter)	350	39	10	19.27 meters.

LEITCH.

General locality.—Eastern shore of Patuxent River, on prominent point opposite mouth of Swanson Creek, given on chart as Gods Grace Point, but known locally as Leitchs Point. (See Chart No. 26.)

Immediate locality.—Observed station is on sand and grass land about 1 foot above high water and 3 yards north of straight line connecting two round points. It is about 13 yards northwest of the lower of these two points and 9 yards east of upper point. A creek 3 feet wide has its mouth about 19 yards east by south of the station. There are no permanent objects near station.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Prince" (N 83° 00′ W)	0	00	00	¾ mile.
Near end of corner peak of roof of large house on hill	25	02	..	1¾ miles.
Near end of peak of wharf-house roof	77	46	..	¼ mile.
Right chimney of house	183	32	..	⅛ mile.
Right chimney of Gourley house	253	58	..	2 miles.
Canning-house stack	277	22	..	2 miles.
"Catholic Church Cross"	281	35	30	2 miles.
Chimney of small house	308	52	..	1 mile.
Right outside chimney of old house	328	43	..	1¼ miles.
Right outside chimney of old house	343	05	..	1½ miles.

FODDER.

General locality.—Western shore of Patuxent River on the southern side of the mouth of Swanson Creek about 1 mile west-southwest of Leitch Wharf and ¾ mile west-northwest of Point Judith (locally known as Teague Point). (See Chart No. 26.)

Immediate locality.—Observed station is on the edge of cultivated land about 10 feet above high-water mark, 4 yards west of edge of bank, and 9 yards north of another edge. Cement monument marking reference station is 15.21 meters S 60° 52′ W of observed station.

Marks.—Observed station is center point of triangle on standard cement monument with a top 9 inches square and 8 inches above surface of ground. Reference station is center point of triangle on standard cement monument with a top about 8 inches square and 5 inches above surface ground.

References.—	°	′	″		
"Prince" (N 25° 00′ E)	0	00	00	.....	½ mile.
Near peak of large house on bluff	17	55	..	.....	2 miles.
Right corner of house	24	08	..	.....	1¾ miles.
Near peak of Leitch Wharf house	35	11	..	.....	1¼ miles.
Left peak of Leitch house	48	37	..	.....	1¼ miles.
Front peak of house at Buena Vista	75	00	..	.....	1¼ miles.
Chimney outside left end of house on hill	87	16	..	.....	2 miles.
Near peak of small house	101	33	..	.....	⅜ mile.
Large chimney on small house	174	43	..	.....	1 mile.
Left side of left chimney outside Bowling house	211	47	..	.....	¾ mile.
REFERENCE STATION	215	52	30	.....	15.21 meters.
Left corner of house on top of hill	318	27	..	.....	1 mile.

BUENA.

General locality.—Eastern shore of Patuxent River about 1¾ miles northeast of Benedict at place known as Buena Vista. (See Chart No. 26.)

Immediate locality.—Observed station is in a field on land adjoining house owned by S. V. Smith and occupied by Dr. Huggins. It is about 10 feet above high water, 8 yards east of edge of bank, and 12 yards south of a rail fence. Cement monument marking reference station is 11.11 meters N 5° 42′ E of observed station and near fence.

Marks.—Observed station is nail in stub with top 2 inches above ground. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Hallowing" (S 27° 22′ W)	0	00	00	.....	1¼ miles.
Center of red roof on square house near Benedict	18	05	..	.....	2 miles.
Canning-house stack	21	30	..	.....	1¾ miles.
"Catholic Church Cross"	29	04	10	.....	1¾ miles.
Nail in blaze in locust tree (4 inches diameter)	31	48	40	.....	8.58 meters.
Left chimney of old house	66	15	..	.....	3 miles.
Left chimney of old house	72	52	..	.....	3 miles.
Nail in blaze on cherry tree (2 inches diameter)	99	05	..	.....	9.70 meters.
Peak of roof of large house	99	15	..	.....	4 miles.
Chimney of house near Leitch Wharf	108	52	..	.....	1 mile.
Nail in blaze on fence post	143	33	50	.....	11.18 meters.
REFERENCE STATION	158	20	20	.....	11.11 meters.
Near corner of house	159	44	..	.....	25 yards.
Cherry tree on fence line (15 inches diameter)	221	25	..	.....	35 yards.
Double apple tree (30 inches diameter)	290	54	..	.....	59 yards.

TEAGUE.

General locality.—Western shore of Patuxent River on point on southern side of entrance to Swanson Creek, locally known as Teague Point, and given on chart as Point Judith. (See Chart No. 26.)

Immediate locality.—Observed station is on gravel and grass land about 3 feet above high water, about 11 yards from south side, 16 yards from north-northeast side, and 75 yards west by north of extreme end of point. Bushes stand between station and north side of point. There are no permanent reference objects near station.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Buena" (N 85° 24′ E)	0	00	00	1½ miles.
Tangent of Teague Point	20	00	..	75 yards.
Near corner of right chimney of Gourley house near Hallowing Point	65	45	..	1¼ miles.
Canning-house stack	106	18	..	1¼ miles.
Near end of peak of hotel	108	12	..	1¼ miles.
Left one of two ivy-covered chimneys	110	25	..	1 mile.
"Catholic Church Cross"	114	11	10	1 mile.
Chimney on Slye House	130	30	..	2 miles.
Left chimney of house on hill	144	57	..	2 miles.
Tanget of high-water mark	168	00	..	75 yards.
Near end of peak of roof	223	41	..	1 mile.
Chimney on large house on hill	243	20	..	3 miles.
Left chimney on house	301	17	..	1 mile.
Near end of peak of roof on store at Buena Vista	355	59	..	1¼ miles.

CATHOLIC CHURCH CROSS (BENEDICT).

General locality.—Western shore of upper Patuxent River in the town of Benedict. (See Chart No. 26.)

Immediate locality.—Observed station is on Catholic Church, located on the main street of the town of Benedict about one-fourth mile from the wharf.

Marks.—Observed station is center point of cross on church.

References.—None necessary.

CITY.

General locality.—Western shore of Patuxent River on Town Point about one-fourth mile north-northeast of Benedict steamboat wharf. (See Chart No. 26.)

Immediate locality.—Observed station is on gravel and shell point about 4 feet above high water, 12 yards northwest of the shore, 63 yards west-southwest of a shanty, about 100 yards west-southwest of extreme end of point, and 11 yards southeast of a slough. There are no permanent reference objects near station.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Hallowing" (S 51° 21′ E)	0	00	00	½ mile.
Windmill near Sheridan Point	21	39	..	3½ miles.
Two middle chimneys at Dowells	21	39	..	3½ miles.
Left tangent of peak of wharf-house roof	81	34	..	¼ mile.
Center of roof of square house	84	36	..	½ mile.
Canning-house stack	95	22	..	¼ mile.
Nearest ivy-covered chimney of old house	130	14	..	⅛ mile.
"Catholic Church Cross"	142	58	50	¼ mile.
Left square chimney of house	245	42	..	1¾ miles.
Near end of peak of roof of Huggins house	280	54	..	1½ miles.
Near corner of shanty	300	44	..	63 yards.
Right chimney of Gourley house	339	20	..	¾ mile.
Chimney of old building behind wharf	352	01	..	¾ mile.

HALLOWING.

General locality.—Eastern shore of Patuxent River on point opposite Benedict, known locally as Holland Point, but given on charts as Hallowing Point. (See Chart No. 26.)

Immediate locality.—Observed station is on a rounded gravel and grass point about 250 yards south of wharf on Holland Point, about 2 feet above high water, 10 yards north of shore, 8 yards east of shore, and 15 yards outside of a group of locust trees, sugar-berry trees, and bushes.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"City" (N 51° 21′ W)	0	00	00	.....	¾ mile.
Left end of peak of roof of wharf house on Holland Point	23	15	..	.....	250 yards.
Chimney of store at Buena Vista	77	27	..	.....	1¾ miles.
Nail in blaze in nearest one of group of four sugar-berry trees (each 8 inches diameter)	92	24	..	.....	12.88 meters.
Nail in blaze in sugar-berry tree (10 inches diameter)	109	58	50	.....	15.74 meters.
Nail in blaze in locust tree (4 inches diameter)	167	55	40	.....	11.90 meters.
Smokepipe on Trent Hall Wharf building	227	35	..	.....	2¼ miles.
Outside chimney of detached house at Sothorons	309	54	..	.....	1½ miles.
Center of roof on square house	314	15	..	.....	¾ mile.
Canning-house stack	333	16	..	.....	½ mile.
"Catholic Church Cross"	347	44	20	.....	¾ mile.

INDIAN.

General locality.—Western shore of Patuxent River on north side of entrance to Indian Creek and about one-fourth mile below Benedict steamboat wharf. (See Chart No. 26.)

Immediate locality.—Observed station is about 3 feet above high water, 7 yards west of shore, 16 yards northeast of a fence and a line of trees, 13 yards southwest of a lone locust tree, about 250 yards to the south-southeast of a large square house, and 125 yards east-northeast of another house.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Sothoron" (S 23° 11′ E)	0	00	00	.....	1 mile.
Nail in blaze in locust tree near fence (5 inches diameter)	33	48	50	.....	15.57 meters.
Nail in blaze in middle branch of locust tree (6 inches diameter)	66	24	50	.....	19.13 meters.
Square chimney on old house	137	23	..	.....	1¼ miles.
Right chimney of square house	188	30	..	.....	⅛ mile.
Near end of peak of roof of hotel	206	26	..	.....	¼ mile.
Canning-house stack	213	22	10	.....	¼ mile.
Nail in blaze in left branch of locust tree (5 inches diameter)	225	28	..	.....	12.90 meters.
Right tangent of Benedict Wharf	228	10	..	.....	½ mile.
Chimney of house near "Buena Vista"	245	58	..	.....	2¼ miles.
Chimney of Gourley house	270	28	..	.....	1 mile.
Windmill at Dowell's on Sheridan Point	344	48	..	.....	4¼ miles.
Left of right chimney on Dowell house	344	48	..	.....	4¼ miles.

DWARF.

General locality.—Eastern shore of Patuxent River about 2 miles north-northwest of Sheridan Point and about 1½ miles southeast of Benedict on a point of land opposite the mouth of Indian Creek. (See Chart No. 26.)

Immediate locality.—Observed station is on sand and grass land about 1 foot above high-water mark, 6 yards northeast from extreme end of point, 4 yards east of one edge of shore, and 6 yards north of another edge of shore. Point on which station is located has a sugar-berry tree, several small locust trees and water bushes, and a pond behind bushes and trees about 100 yards to the east.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Sothoron" (S 42° 05′ W)	0	00	00	¾ mile.
Nearest corner of top of nearest chimney on tenant house	80	31	..	2 miles.
Center of roof of square house	83	16	..	1 mile.
Nail in blaze in locust tree (4 inches diameter)	93	38	30	4.22 meters.
Canning-house stack	95	03	33	1¼ miles.
"Catholic Church Cross"	99	03	10	1¼ miles.
Left tangent of wharf	124	19	..	¾ mile.
Nail in sugar-berry tree (10 inches diameter)	152	38	30	8.94 meters.
Nail in blaze in locust tree (3 inches diameter)	196	22	20	2.68 meters.
Chimney on small house	258	48	..	2 miles.
Left point of peak of roof of Dowell's	287	30	..	2¼ miles.
Left end of peak of roof of Trent Hall Wharf	315	35	..	1½ miles.
Middle cupola on stable	321	12	20	1½ miles.
Right pillar on Sothoron house porch	359	21	..	1 mile.

SOTHORON.

General locality.—Western shore of Patuxent River on Long Point between entrances to Indian and Trent Hall creeks. (See Chart No. 26.)

Immediate locality.—Observed station is on sand and grass lowland about 1 foot above high-water mark among cedar trees, about 24 yards west by north of extreme end of point, 12 yards north of one edge of shore and 30 yards southwest of another edge of shore.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Hallowing" (N 13° 51′ E)	0	00	00	1¼ miles.
Nearest chimney on Gourley house	3	55	..	1¼ miles.
Nail in blaze in locust tree (4 inches diameter)	30	49	..	3.35 meters.
Left end of peak of roof of Dowell house	120	35	..	2¼ miles.
Middle cupola on Trent Hall stable	150	25	00	1¼ miles.
Point of middle attic window on John Bullinger house	187	42	..	1 mile.
Left pillar of porch of Sothoron house	206	23	..	½ mile.
Nail in blaze in cedar tree (12 inches diameter)	242	51	50	8.12 meters.
Near corner of nearest chimney on Slye house	291	05	20	2 miles.
Nail in blaze in locust tree (4 inches diameter)	302	29	40	10.83 meters.
Right one of two outside chimneys on old house on hill on property of A. B. Slye	307	31	..	2 miles.
Center of roof on square house	323	39	..	1 mile.
Nail in blaze in locust tree (6 inches diameter)	350	24	10	12.81 meters.

BUZZ.

General locality.—Northeast shore of Patuxent River on southwest side of Buzzards Island near mouth of Buzzards Island Creek. (See Chart No. 26.)

Immediate locality.—Observed station is on marsh, clay, and grass land on wooded island about 2 feet above high water, 5 yards northeast of river shore and 40 yards northwest of extreme point of island. Cement monument marking reference station is 8.97 meters N 42° 23′ E of observed station.

Marks.—Observed station is nail in stub with top flush with ground. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Morsel" (S 25° 23′ E)	0	00	00	¾ mile.
Smokepipe on roof of storehouse	39	11	..	2 miles.
Near corner of near chimney	40	36	..	2 miles.
Chimney of Trent Hall	50	48	..	1¼ miles.
Nearest of three cupolas on stable	54	36	50	1¼ miles.
Left piazzi post at Sothorons	102	41	..	1¼ miles.
Center of roof of square house	155	15	..	1¾ miles.
"Catholic Church Cross"	164	56	..	2 miles.
Nail in blaze in oak tree (18 inches diameter)	172	14	..	4.55 meters.
Nail in blaze in oak tree (18 inches diameter)	198	36	40	13.16 meters.
Nail in blaze in oak tree (24 inches diameter)	235	08	30	9.62 meters.
REFERENCE STATION	252	45	45	8.97 meters.
Nail in blaze in pine tree (5 inches diameter)	255	43	..	6.52 meters.
Chimney on house across creek	313	23	..	¼ mile.

BOUNDARIES OF OYSTER BARS.

EXPLANATION.

The law of the United States authorizing the cooperation of the Department of Commerce and Labor in the survey of natural oyster bars of Maryland provides for the designation and employment by the Department of Commerce and Labor of such officers, experts, and other technically qualified persons "as may be necessary to cooperate with the Maryland State Board of Shell Fish Commissioners in making a survey of and locating the natural oyster beds, bars, and rocks in the waters within the State of Maryland." The oyster laws of Maryland provide that the Maryland Shell Fish Commissioners, with the aid of such persons as may be designated by the Government, shall proceed "to have laid out, surveyed, and designated on the said charts the natural beds and bars, and shall cause to be marked and defined as accurately as practicable the limits and boundaries of the natural beds, bars, and rocks as established by said survey, and they shall take true and accurate notes of said survey in writing, and make an accurate report of said survey, setting forth such a description of landmarks as may be necessary to enable the said board, or their successors, to find and ascertain the boundary lines of the said natural oyster beds, bars, and rocks, as shown by a delineation on the maps and charts." The oyster laws of Maryland also provide in another section that there shall "be made a true and accurate survey of the natural oyster beds, bars, and rocks * * * with reference to fixed and permanent objects on the shore, giving courses and distances, to be fully described and set out in a written report of said survey."

Under the provisions of the laws quoted above the State of Maryland, in cooperation with the Department of Commerce and Labor, must define the boundaries of the natural oyster bars "as accurately as practicable" and also "with reference to fixed and permanent objects on the shore, giving courses and distances." The requirement of "as accurately as practicable" is easily fulfilled by definition of the location of the corners of the oyster bars by latitude and longitude. In fact, this method is probably the most satisfactory and accurate one that could be used for all purposes of legal definition or for relocation of the oyser-bar boundaries by competent engineers. Therefore the additional requirement of "giving courses and distances" is superfluous and is only fulfilled in the published definitions on account of the specific provisions of the law making it compulsory. This part of the description of boundaries has involved an immense amount of extra computations in order to prevent technical discrepancies between the latitude and longitude of a corner of an oyster bar and its distance and bearing from objects on shore of known latitude and longitude without adding anything to the accuracy and very little to the convenience of practical use of the descriptions of the oyser-bar boundaries.

As provided by law the boundaries of the oyster bars are all straight lines, but in the work already completed they have inclosed areas of all shapes from triangles to complicated 14-sided figures, and of all sizes from 4 acres to 7,548 acres. The sides have varied in length from 93 to 7,529 yards, and in some cases the corners of the boundaries have been practically at the triangulation stations from which they are located, while in other instances they were over 13,600 yards from the landmarks most available for the purpose of fixing their position.

The varied characteristics of the legal boundaries of the oyster bars indicated by the above statement, together with the complicated requirements of the law under which the survey has been made and the magnitude of the work with the consequent need of fixed and uniform methods, have made the problem of describing the boundaries one of considerable difficulty and great importance.

The boundaries of the oyster bars of Maryland, as established by the Shell Fish Commission and delineated on the Coast and Geodetic Survey charts and projections and on the leasing charts of the Commission, are technically defined and described by a method somewhat different from that used in other oyster surveys. But it is believed that the forms finally adopted will fulfill all needs of the survey for both the present and the future.

METHOD OF DESCRIBING BOUNDARIES.

The descriptions have been arranged in tabular form, thus avoiding many hundred repetitions of the same words by making one explanation of the tables sufficient for all oyster bars in each county.

Title.—At the top of each tabular form is given the legal name of the oyster bar to be described, and the one by which it is known and designated in the published oyster records and on the oyster charts. The adopted name of the oyster bar is the one used locally, as nearly as could be ascertained by the hydrographic engineer of the Commission; and when there was no local name in common use a name was selected from one of the prominent features of the vicinity that would naturally suggest the section of the waters where the oyster bar was located.

Underneath the name, in parentheses, is given the general locality of the oyster bar and the serial number of the "Maryland Oyster Chart" on which its legal boundaries are shown.[a]

First column.—This column, under the heading of "Corner of bar," gives the number corresponding to the corner of the boundary as shown on the charts and to the number on the buoy marking the actual corner of the bar. The numbers of the corners have been assigned by naming the southernmost point No. 1, thence proceeding in a clockwise direction around the bar. Where a corner of one oyster bar is identical with the corner of the boundaries of one or more other oyster bars, only the number of the corner of the oyster bar being described in the table is given in this column.

Second and third columns.—These two columns, under the headings of "Latitude" and "Longitude," give the geographic positions of the corners. These positions have been adopted by the Commission as the primary technical definition of the location of the corners, and should be considered as final in case of a dispute arising from discrep-

[a] These charts can be obtained by application to the Superintendent of the Coast and Geodetic Survey at Washington, D. C.

ancies caused by other means of location. The latitudes and longitudes given in these columns are based on the United States standard datum of the Coast and Geodetic Survey, and the points thus defined can be relocated from distant triangulation stations of the survey, even though all the landmarks and buoys originally used for their location have been destroyed by natural or other causes.

Fourth and fifth columns.—These two columns, under the general heading of "True bearing"[a] and the specific headings "Forward" and "Back," give bearings measured from a true north-and-south line. The three "Forward" bearings are from the corner of the boundary designated in the first column to the triangulation stations named on the corresponding lines in the last column, and the three "Back" bearings are from these same stations in the last column to the corresponding corner of boundary in the first column. The difference in minutes of arc between the forward and back bearings shown in some cases is actual and not accidental, and is due to the fact that the computations took into account the spheroidal shape of the earth.

Sixth column.—This column, under the heading of "Distance," gives the three computed distances in yards from the corner of the bar noted in the first column to the three triangulation stations named on the corresponding lines in the last column, and vice versa.

Seventh column.—This column, under the heading of "U. S. C. & G. S. triangulation station,"[b] gives the names of the landmarks from which were computed the corresponding "Latitude," "Longitude," "True bearing," and "Distance" of the "Corner of the bar" designated in the first column. A full description of the location and markings of these triangulation stations is given in another part of this publication under the heading of "Descriptions of triangulation stations."

SURVEYING METHODS FOR RELOCATION OF BOUNDARIES.

There are a number of methods that can be used in the relocation of the actual boundaries of the natural oyster bars as technically described in this publication and delineated on the published charts of the Coast and Geodetic Survey and the leasing charts of the Shell Fish Commission.

The following brief descriptions of five of these more or less different methods assume a certain amount of experience and knowledge on the part of the engineer in the particular kind of surveying under consideration, and are only intended as reminders of ways and means that can be used.

There are two problems that are likely to present themselves to those interested in the boundaries of natural oyster bars: one, to determine whether the buoys marking the corners have been dragged or otherwise moved from their correct positions, and the other, to relocate or reestablish a buoy at the point from which it was removed. The different ways of solving these two problems partly depend upon the instruments possessed by the engineer and his assistants and partly on his training and experience.

(1) *Triangulation.*—This method is the one that will give the greatest accuracy, but on account of its requiring special data and instruments, and being an operation

[a] The mean magnetic variation for Charles County was 5° 20′ west of north in 1910 and increasing at the rate of 4′ yearly.

[b] Geographic positions of these triangulation stations can be obtained by application to the Superintendent of the Coast and Geodetic Survey, Washington, D. C.

rarely used by engineers not engaged in geodetic surveying, it is recommended only for cases in dispute that can not be settled satisfactorily by some other method. An explanation of this class of work would be too long for a report of this sort, and those not familiar with this method are referred to the publications on the subject by the Coast and Geodetic Survey.

(2) *Hydrographic.*—This method is the most simple and satisfactory one that can be adopted if the surveyor can obtain the use of the necessary instruments and assistants. It is the one best suited for the work of the engineers of the Commission in relocating corners of boundaries, as it gives results of the accuracy ordinarily required and is rapid in execution. Besides, it has the advantage of being available whenever three triangulation stations of suitable relative positions are visible from the offshore points needing relocation.

Most navigators and others familiar with the use of a sextant are well acquainted with the graphic three-point method of fixing a position on water, and only a brief description of the operation will be stated.

In the case where there is only one engineer having a single sextant, the three-point method can be used if the two angles determining the position of a buoy are first derived from the "Forward" bearings given in the tabular forms describing the boundaries of the oyster bars. For example, take "Stoddard" oyster bar, which is the first one described in this publication, and assume that "Corner No. 3," is to be examined as to its position. The angle between the two landmarks "Key" and "Upper" as determined from right to left from the forward bearings from this corner is 122° 28′ and the angle between "Upper" and "Stoddard" is 88° 43′. Having these two angles, the engineer proceeds to the buoy of doubtful location and measures the actual sextant angles between the landmarks for which the calculations were made. If the measured and calculated angles do not agree the buoy is not in its correct position and the boundary corner must be relocated. This is accomplished by moving the boat about until a point is reached where the angles do agree, and this point being the desired location, the buoy can be placed in its correct position.

If the engineer can obtain the use of both a sextant and a three-arm protractor ("position finder"), the availability of the hydrographic method is increased, as the use of the protractor is essential in case of the washing away or destruction of one or more of the landmarks originally used in describing the boundaries. Under these circumstances, any three landmarks of suitable relative position that are visible from the point to be located can be utilized. For example, the engineer can proceed to the buoy of doubtful position and measure the two adjacent sextant angles between the three landmarks selected. These two angles are set off on the three-arm protractor and the actual position of the buoy plotted on the chart by shifting the protractor about until the edge of each of the three arms passes through the center of the symbols on the chart marking the position of the three landmarks selected. The center of the hub of the protractor will indicate on the chart the actual position of the buoy, and if the point thus obtained does not coincide with the true position of the corner of the boundary as given on the chart, the surveyor can proceed to locate the buoy correctly by reversing the operation. This is done by placing the center point of the hub of the protractor over the corner of the boundary in question and measuring on the chart the two adjacent protractor angles between the three selected landmarks. One of the

angles thus obtained is set on the sextant and the boat moved about until the two landmarks are shown by the sextant to subtend the same angle obtained from the protractor. The second angle is then placed on the sextant and the same operation gone through, and so on, first using one angle on the sextant then the other until a point is reached where both observed sextant angles are practically identical with the protractor angles. The point thus located is the desired one and the buoy can be placed to mark the true position of the corner of the boundary in question.

If the engineer possesses two sextants and a protractor, this problem is far easier of solution, as the two angles can be set off on separate sextants and the observer can quickly find the desired point where they agree with the protractor angles by using one sextant after the other without the need of resetting either.

If there are two observers, two sextants, and a protractor, it can be seen that the best conditions for both rapid and accurate hydrographic location of a point is attained. In fact, this is the method by which the buoys at the corners of the boundaries were originally placed by the hydrographic engineer to the Commission.

(3) *Magnetic bearings from offshore.*—This method of fixing a position on water is a simple and well-known one in navigation. It is available to anyone having a boat compass and will be of special use to the State fishery force in investigating cases where buoys are supposed to have been moved for illegal purposes.

In the case where a buoy is supposed to have been moved from its true position the observer can take compass bearings to the three landmarks given in the last column of the tables opposite the boundary corner in question. These bearings are then corrected for the local declination,[a] and if the results agree with the published bearings the buoy is correctly located.

In the case where the buoy is not in its correct position, or has disappeared altogether, the desired point can be determined by maneuvering the vessel until the corrected bearings agree with the ones in the tabular descriptions, when the buoy can be anchored in its proper location.

In the case where the landmarks, for which the bearings are published, have been destroyed or washed away, any landmarks whose positions are indicated on the charts can be used. This can be done by getting their bearings directly from the chart by parallel rulers or a protractor and then applying these new bearings in the same manner as the ones published in the tables.

(4) *Magnetic bearings from shore.*—This method will be of special value to engineers having an ordinary surveyor's compass. The compass can be set over the point marking a "triangulation station" on shore, the name of which is given in the last column opposite the "corner" in question. The instrument is then set at the corresponding "back" bearing (corrected for local magnetic declination) given in the fifth column of the tables opposite the "corner" in question. The direction thus determined will give one range on which the desired point must be located. The compass can then be moved to a second triangulation station and another range located in a similar manner. The intersection of these two range lines will give the desired point; but in general it should be checked by an additional range line determined from a third station.

[a] The mean magnetic variation for Charles County is 5° 20′ west of north in 1910 and increasing at the rate of 4′ yearly.

(5) *Horizontal angles measured at landmarks.*—This process is a modification of the triangulation method, and will be useful to engineers who have a transit and desire considerable accuracy.

The instrument is placed over a "triangulation station," the name of which appears in the last column of the tabular description opposite the "corner" in question. The telescope is then pointed to the landmark indicated in the "Descriptions of landmarks" as having a direction of 0° 00′ 00″ from the triangulation station being occupied by the transit. The tabular description of the boundaries is next examined and the "back" bearing of the questionable boundary "corner" from the landmark being occupied is taken out. The angle calculated from this "back" bearing and the bearing given in parentheses alongside the zero landmark in the "Descriptions of landmarks" is then set off on the transit and a range line established on which the desired point must be located. A similar process is then carried on at a second station, and so on until the position of the buoy is satisfactorily fixed.

BOUNDARIES OF NATURAL OYSTER BARS.

STODDARD.

(*Upper Wicomico River—Chart No. 26.*)

Corner of bar.	Latitude.	Longitude.	True bearing.		Distance.	U. S. C. & G. S. triangulation station.
			Forward.	Back.		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 21 30.76	76 50 51.20	N 55 14 E	S 55 15 W	1,199	Key.
			N 87 09 W	S 87 10 E	856	Stoddard.
			S 52 52 W	N 52 52 E	1,354	Hayden.
2	38 21 31.00	76 51 14.34	N 37 05 W	S 37 05 E	1,102	Upper.
			N 81 54 W	S 81 54 E	244	Stoddard.
			S 29 24 W	N 29 23 E	947	Hayden.
3	38 21 38.90	76 51 14.82	N 75 46 E	S 75 46 W	1,663	Key.
			N 46 42 W	S 46 42 E	896	Upper.
			S 44 35 W	N 44 35 E	326	Stoddard.
4	38 21 38.74	76 50 51.60	N 67 24 E	S 67 24 W	1,078	Key.
			N 64 01 W	S 64 01 E	1,411	Upper.
			S 74 59 W	N 74 59 E	875	Stoddard.

WICOMICO LUMPS.

(Upper Wicomico River—Chart No. 26.)

Corner of bar.	Latitude.	Longitude.	True bearing. Forward.	True bearing. Back.	Distance.	U. S. C. & G. S. triangulation station.
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 20 17.64	76 51 40.36	S 85 05 E	N 85 05 W	1,834	Fact.
			N 15 14 W	S 15 14 E	775	Burr.
			S 54 28 W	N 54 27 E	973	Bowman.
2	38 20 33.54	76 51 45.42	N 17 57 E	S 17 57 W	1,168	Hayden.
			N 18 07 W	S 18 07 E	223	Burr.
			S 30 50 W	N 30 50 E	1,284	Bowman.
3	38 21 10.18	76 50 51.08	S 84 22 E	N 84 22 W	897	Cohouck.
			N 49 23 W	S 49 24 E	1,131	Stoddard.
			S 83 30 W	N 83 29 E	1,090	Hayden.
	Thence along county boundary as delineated on Chart No. 26 to corner No. 4.					
4	38 20 51.98	76 50 58.86	N 64 26 E	S 64 26 W	1,218	Cohouck.
			N 60 46 W	S 60 46 E	1,004	Hayden.
			S 72 34 W	N 72 34 E	1,368	Burr.
	Thence along county boundary as delineated on Chart No. 26 to corner No. 5.					
5	38 20 20.70	76 51 13.00	N 55 17 W	S 55 17 E	1,132	Burr.
			S 66 14 W	N 66 13 E	1,660	Bowman.
			S 76 42 E	N 76 42 W	1,132	Fact.

MILLS WEST.

(Upper Wicomico River—Chart No. 26.)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 19 50.98	76 51 45.74	N 2 07 W	S 2 07 E	1,648	Burr.
			N 62 50 W	S 62 50 E	729	Bowman.
			S 26 44 E	N 26 43 W	1,156	Eedling.
2	38 20 17.64	76 51 40.36	S 85 05 E	N 85 04 W	1,834	Fact.
			N 15 14 W	S 15 14 E	775	Burr.
			S 54 28 W	N 54 27 E	973	Bowman.
3	38 20 20.70	76 51 13.00	N 55 17 W	S 55 17 E	1,132	Burr.
			S 66 14 W	N 66 13 E	1,660	Bowman.
			S 76 42 E	N 76 42 W	1,132	Fact.
	Thence along county boundary as delineated on Chart No. 26 to corner No. 4.					
4	38 20 00.00	76 51 11.88	N 88 54 W	S 88 55 E	1,548	Bowman.
			S 15 50 W	N 15 50 E	1,392	Eedling.
			N 67 44 E	S 67 44 W	1,157	Fact.

JOES LUMPS.

(*Middle Wicomico River—Chart No. 26.*)

Corner of bar.	Latitude.	Longitude.	True bearing. Forward.	True bearing. Back.	Distance.	U. S. C. & G. S. triangulation station.
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 19 04.42	76 50 28.14	N 78 10 E	S 78 11 W	961	Farr.
			N 2 14 W	S 2 14 E	2,313	Fact.
			S 77 22 W	N 77 22 E	1,049	Gust.
2	38 19 04.52	76 51 04.74	S 12 18 W	N 12 18 E	233	Gust.
			N 84 14 E	S 84 15 W	1,923	Farr.
			N 46 57 W	S 46 57 E	779	Eedling.
3	38 19 11.00	76 51 12.82	S 19 58 E	N 19 58 W	480	Gust.
			S 89 18 E	N 89 17 W	2,128	Farr.
			N 48 33 W	S 48 33 E	474	Eedling.
4	38 19 22.46	76 51 17.14	N 47 25 W	S 47 26 E	1,913	Bowman.
			S 73 02 W	N 73 02 E	250	Eedling.
			S 18 27 E	N 18 27 W	879	Gust.
5	38 19 50.98	76 51 45.74	N 2 07 W	S 2 07 E	1,648	Burr.
			N 62 50 W	S 62 50 E	729	Bowman.
			S 26 44 E	N 26 43 W	1,156	Eedling.
6	38 20 00.00	76 51 11.88	N 88 54 W	S 88 55 E	1,548	Bowman.
			S 15 50 W	N 15 50 E	1,392	Eedling.
			N 67 44 E	S 67 44 W	1,157	Fact.
	Thence along county boundary as delineated on Chart No. 26 to corner No. 1.					

WINDMILL.

(*Middle Wicomico River—Chart No. 26.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 18 13.28	76 50 55.00	S 20 55 E	N 20 55 W	502	Hedney.
			S 87 33 E	N 87 32 W	2,227	Lyon.
			N 11 43 W	S 11 43 E	1,523	Gust.
2	38 18 35.66	76 50 54.30	S 7 28 E	N 7 28 W	1,237	Hedney.
			S 68 56 E	N 68 55 W	2,359	Lyon.
			N 23 54 W	S 23 54 E	809	Gust.
3	38 18 45.28	76 51 04.61	S 15 43 E	N 15 43 W	1,604	Hedney.
			S 64 37 E	N 64 36 W	2,745	Lyon.
			N 7 25 W	S 7 25 E	421	Gust.
4	38 18 53.20	76 50 57.30	S 7 32 E	N 7 32 W	1,834	Hedney.
			N 71 28 E	S 71 29 W	1,809	Farr.
			N 59 02 W	S 59 02 E	289	Gust.
5	38 19 04.52	76 51 04.74	S 12 18 W	N 12 18 E	233	Gust.
			N 84 14 E	S 84 15 W	1,923	Farr.
			N 46 57 W	S 46 57 E	779	Eedling.
6	38 19 04.42	76 50 28.14	N 78 10 E	S 78 11 W	961	Farr.
			N 2 14 W	S 2 14 E	2,313	Fact.
			S 77 22 W	N 77 22 E	1,049	Gust.
	Thence along the county boundary as delineated on Chart No. 26 to corner No. 7.					
7	38 18 24.45	76 50 16.82	S 44 40 W	N 44 39 E	1,189	Hedney.
			S 68 42 E	N 68 42 W	1,299	Lyon.
			N 22 31 E	S 22 31 W	1,672	Farr.

FENWICK.

(*Middle Wicomico River—Chart No. 26.*)

Corner of bar.	Latitude.	Longitude.	True bearing. Forward.	True bearing. Back.	Distance.	U. S. C. & G. S. triangulation station.
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 17 55.86	76 50 36.14	N 69 46 W	S 69 46 E	343	Hedney.
			S 14 00 E	N 14 00 W	1,227	Charles.
			N 74 04 E	S 74 04 W	1,792	Lyon.
2	38 18 13.28	76 50 55.00	S 20 55 E	N 20 55 W	502	Hedney.
			S 87 33 E	N 87 32 W	2,227	Lyon.
			N 11 43 W	S 11 43 E	1,523	Gust.
3	38 18 24.45	76 50 16.82	S 44 40 W	N 44 39 E	1,189	Hedney.
			S 68 42 E	N 68 42 W	1,299	Lyon.
			N 22 31 E	S 22 31 W	1,672	Farr.
	Thence along the county boundary as delineated on Chart No. 26 to corner No. 4.					
4	38 17 55.98	76 50 08.16	N 63 31 E	S 63 32 W	1,095	Lyon.
			N 83 52 W	S 83 52 E	1,072	Hedney.
			S 20 30 W	N 20 30 E	1,275	Charles.

WICOMICO MIDDLE GROUND.

(*Middle Wicomico River—Chart No. 26.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 17 26.40	76 49 42.82	S 68 36 E	N 68 35 W	1,357	Weiss.
			N 11 40 E	S 11 40 W	1,520	Lyon.
			S 80 01 W	N 80 00 E	1,137	Charles.
2	38 17 31.78	76 50 25.60	S 2 32 E	N 2 32 W	379	Charles.
			N 47 54 E	S 47 55 W	1,945	Lyon.
			N 32 54 W	S 32 54 E	1,108	Hedney.
3	38 17 55.86	76 50 36.14	N 69 46 W	S 69 46 E	343	Hedney.
			S 14 00 E	N 14 00 W	1,227	Charles.
			N 74 04 E	S 74 04 W	1,792	Lyon.
4	38 17 55.98	76 50 08.16	N 63 31 E	S 63 32 W	1,095	Lyon.
			N 83 52 W	S 83 52 E	1,072	Hedney.
			S 20 30 W	N 20 30 E	1,275	Charles.
	Thence along county boundary as delineated on Chart No. 26 to corner No. 1.					

CHARLESTON CREEK.

(*Middle Wicomico River—Chart No. 26.*)

Corner of bar.	Latitude.	Longitude.	True bearing. Forward.	True bearing. Back.	Distance.	U. S. C. & G. S. triangulation station.
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 16 45.98	76 50 04.48	S 3 51 E	N 3 51 W	697	Hard.
			N 64 45 E	S 64 45 W	2,033	Weiss.
			N 25 02 W	S 25 03 E	1,286	Charles.
2	38 17 10.08	76 50 04.50	S 1 48 E	N 1 48 W	1,508	Hard.
			N 88 17 E	S 88 18 W	1,841	Weiss.
			N 57 01 W	S 57 01 E	649	Charles.
3	38 17 26.40	76 49 42.82	S 68 36 E	N 68 35 W	1,357	Weiss.
			N 11 40 E	S 11 40 W	1,520	Lyon.
			S 80 01 W	N 80 00 E	1,137	Charles.
	Thence along county boundary as delineated on Chart No. 26 to corner No. 4.					
4	38 16 55.66	76 49 32.82	N 61 31 E	S 61 32 W	1,133	Weiss.
			N 58 48 W	S 58 49 E	1,621	Charles.
			S 37 53 W	N 37 53 E	1,294	Hard.

LANCASTER.

(*Lower Wicomico River—Chart No. 26.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 16 26.20	76 49 48.82	S 73 19 E	N 73 18 W	2,146	Prec.
			N 42 50 E	S 42 51 W	2,093	Weiss.
			S 85 37 W	N 85 37 E	371	Hard.
2	38 16 30.22	76 50 04.42	S 15 25 E	N 15 25 W	170	Hard.
			N 52 43 E	S 52 44 W	2,310	Weiss.
			N 17 50 W	S 17 51 E	1,783	Charles.
3	38 16 45.98	76 50 04.48	S 3 51 E	N 3 51 W	697	Hard.
			N 64 45 E	S 64 45 W	2,033	Weiss.
			N 25 02 W	S 25 03 E	1,286	Charles.
4	38 16 55.66	76 49 32.82	N 61 31 E	S 61 32 W	1,133	Weiss.
			N 58 48 W	S 58 49 E	1,621	Charles.
			S 37 53 W	N 37 53 E	1,294	Hard.
	Thence along the county boundary as delineated in Chart No. 26 to corner No. 5.					
5	38 16 34.94	76 49 13.42	S 50 45 E	N 50 45 W	1,442	Prec.
			N 67 32 E	S 67 32 W	1,791	Blakistone.
			N 21 15 E	S 21 15 W	1,330	Weiss.

ROCK POINT.

(Lower Wicomico River—Chart No. 26.)

Corner of bar-	Latitude.	Longitude.	True bearing. Forward.	True bearing. Back.	Distance.	U. S. C. & G. S. triangulation station.
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 15 53.62	76 49 54.98	N 77 43 E	S 77 43 W	2,271	Prec.
			N 10 53 W	S 10 53 E	1,090	Hard.
			S 47 24 W	N 47 24 E	944	Corner.
2	38 15 53.70	76 50 09.30	S 26 08 W	N 26 08 E	717	Corner.
			N 79 31 E	S 79 32 W	2,644	Prec.
			N 9 18 E	S 9 18 W	1,082	Hard.
3	38 15 56.62	76 50 23.06	S 3 53 E	N 3 53 W	744	Corner.
			N 82 39 E	S 82 40 W	2,991	Prec.
			N 29 10 E	S 29 10 W	1,110	Hard.
4	38 15 56.19	76 50 26.80	S 11 40 E	N 11 40 W	743	Corner.
			N 82 38 E	S 82 39 W	3,091	Prec.
			N 33 03 E	S 33 04 W	1,173	Hard.
5	38 15 58.92	76 50 26.82	S 10 24 E	N 10 24 W	834	Corner.
			N 84 20 E	S 84 22 W	3,081	Prec.
			N 35 42 E	S 35 42 W	1,098	Hard.
6	38 16 00.00	76 50 18.76	S 4 17 W	N 4 17 E	857	Corner.
			N 84 39 E	S 84 40 W	2,864	Prec.
			N 26 30 E	S 26 30 W	956	Hard.
7	38 16 20.60	76 50 01.98	S 18 13 W	N 18 13 E	1,632	Corner.
			S 79 54 E	N 79 53 W	2,443	Prec.
			N 6 59 W	S 6 59 E	162	Hard.
8	38 16 26.20	76 49 48.82	S 73 19 E	N 73 18 W	2,146	Prec.
			N 42 50 E	S 42 51 W	2,093	Weiss.
			S 85 37 W	N 85 37 E	371	Hard.
9	38 16 34.94	76 49 13.42	S 50 45 E	N 50 45 W	1,442	Prec.
			N 67 32 E	S 67 32 W	1,791	Blakistone.
			N 21 15 E	S 21 15 W	1,330	Weiss.
10	38 16 01.56	76 49 33.97	N 82 38 E	S 82 39 W	1,675	Prec.
			N 43 36 W	S 43 36 E	1,108	Hard.
			S 54 07 W	N 54 07 E	1,550	Corner.

SHIPPING POINT.

(Lower Wicomico River—Chart No. 26.)

Corner of bar.	Latitude.	Longitude.	True bearing. Forward.	True bearing. Back.	Distance.	U. S. C. & G. S. triangulation station.
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 15 26.96	76 49 47.60	N 73 48 W	S 73 49 E	930	Corner.
			S 8 55 E	N 8 55 W	1,830	Cobb Point Bar Light.
			S 65 57 E	N 65 57 W	1,858	St. Margaret 2.
2	38 15 28.40	76 50 12.00	S 26 40 E	N 26 40 W	2,078	Cobb Point Bar Light.
			S 71 03 E	N 71 02 W	2,480	St. Margaret 2.
			N 49 15 W	S 49 15 E	322	Corner.
3	38 15 42.76	76 49 57.94	N 5 03 W	S 5 03 E	1,441	Hard.
			S 66 04 W	N 66 04 E	676	Corner.
			S 13 25 E	N 13 25 W	2,406	Cobb Point Bar Light.
4	38 15 53.70	76 50 09.30	S 26 08 W	N 26 08 E	717	Corner.
			N 79 31 E	S 79 32 W	2,644	Prec.
			N 9 18 E	S 9 18 W	1,082	Hard.
5	38 15 53.62	76 49 54.98	N 77 43 E	S 77 43 W	2,271	Prec.
			N 10 53 W	S 10 53 E	1,090	Hard.
			S 47 24 W	N 47 24 E	944	Corner.
6	38 15 45.40	76 49 40.46	N 67 30 E	S 67 31 W	1,985	Prec.
			N 23 43 W	S 23 43 E	1,471	Hard.
			S 71 27 W	N 71 27 E	1,142	Corner.

COBB POINT.

(Lower Wicomico River—Chart No. 26.)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 14 32.61	76 49 24.30	N 45 04 E	S 45 05 W	1,522	St. Margaret 2.
			N 35 52 W	S 35 53 E	2,580	Corner.
			N 85 52 W	S 85 52 E	337	Cobb Point Bar Light.
2	38 14 33.33	76 49 36.93	S 81 09 E	N 81 08 W	3,285	St. Catherine.
			N 53 22 E	S 53 23 W	1,762	St. Margaret 2.
			N 29 39 W	S 29 39 E	2,379	Corner.
3	38 14 38.79	76 49 53.05	S 66 46 E	N 66 45 W	467	Cobb Point Bar Light.
			N 64 48 E	S 64 49 W	2,035	St. Margaret 2.
			N 21 39 W	S 21 40 E	2,030	Corner.
4	38 15 00.00	76 50 16.60	S 49 33 E	N 49 33 W	1,386	Cobb Point Bar Light.
			N 86 28 E	S 86 29 W	2,473	St. Margaret 2.
			N 5 53 W	S 5 53 E	1,173	Corner.
5	38 15 00.00	76 49 47.48	S 17 22 E	N 17 22 W	940	Cobb Point Bar Light.
			N 84 53 E	S 84 54 W	1,701	St. Margaret 2.
			N 37 30 W	S 37 30 E	1,471	Corner.

TEAGUE.

(Upper Patuxent River—Chart No. 26.)

Corner of bar.	Latitude.	Longitude.	True bearing. Forward.	True bearing. Back.	Distance.	U. S. C. & G. S. triangulation station.
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 31 26.32	76 40 15.01	N 74 28 E	S 74 29 W	1,750	Buena.
			N 40 12 W	S 40 12 E	408	Teague.
			S 13 24 W	N 13 24 E	1,222	City.
2	38 31 47.57	76 40 25.32	S 1 23 E	N 1 23 W	405	Teague.
			S 82 47 E	N 82 46 W	1,974	Buena.
			N 23 49 E	S 23 49 W	1,208	Leitch.
3	38 31 41.00	76 40 05.60	S 88 56 E	N 88 56 W	1,436	Buena.
			N 1 28 W	S 1 28 E	1,328	Leitch.
			S 70 21 W	N 70 21 E	545	Teague.
4	38 31 31.00	76 40 00.50	N 76 34 E	S 76 35 W	1,337	Buena.
			N 5 48 W	S 5 48 E	1,673	Leitch.
			N 76 37 W	S 76 38 E	666	Teague.

ELBOW.

(Upper Patuxent River—Chart No. 26.)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 31 11.40	76 40 07.18	N 30 01 W	S 30 02 E	942	Teague.
			S 35 30 W	N 35 30 E	844	City.
			S 12 36 E	N 12 36 W	1,346	Hallowing.
2	38 31 21.38	76 40 07.64	N 66 55 E	S 66 56 W	1,620	Buena.
			N 43 48 W	S 43 48 E	663	Teague.
			S 25 02 W	N 25 02 E	1,131	City.
3	38 31 23.96	76 39 59.32	N 66 36 E	S 66 37 W	1,383	Buena.
			N 60 02 W	S 60 03 E	784	Teague.
			S 32 10 W	N 32 10 E	1,312	City.
4	38 31 15.42	76 39 58.63	N 56 15 E	S 56 16 W	1,505	Buena.
			N 45 45 W	S 45 45 E	973	Teague.
			S 41 07 W	N 41 07 E	1,090	City.

CARPENTERS YARD.

(Upper Patuxent River—Chart No. 26.)

Corner of bar.	Latitude.	Longitude.	True bearing. Forward.	True bearing. Back.	Distance.	U. S. C. & G. S. triangulation station.
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 30 14.21	76 40 28.32	S 59 32 E	N 59 32 W	1,260	Dwarf.
			N 54 22 E	S 54 23 W	1,051	Hallowing.
			N 54 57 W	S 54 57 E	494	Indian.
2	38 30 14.56	76 40 37.12	S 63 45 E	N 63 44 W	1,471	Dwarf.
			N 61 02 E	S 61 03 W	1,240	Hallowing.
			N 32 13 W	S 32 13 E	322	Indian.
3	38 30 24.62	76 40 38.64	N 76 57 E	S 76 58 W	1,158	Hallowing.
			N 21 05 E	S 21 05 W	954	City.
			S 62 54 W	N 62 54 E	148	Indian.
4	38 30 39.94	76. 40 25.60	S 71 56 E	N 71 56 W	822	Hallowing.
			N 0 24 W	S 0 24 E	373	City.
			S 39 18 W	N 39 18 E	752	Indian,
5	38 30 29.62	76 40 20.02	N 81 39 E	S 81 40 W	641	Hallowing.
			N 11 47 W	S 11 48 E	736	City.
			S 69 19 W	N 69 19 E	667	Indian.
6	38 30 24.08	76 40 27.79	N 71 36 E	S 71 37 W	886	Hallowing.
			N 3 29 E	S 3 29 W	910	City.
			S 83 20 W	N 83 20 E	421	Indian.

APPENDIXES.

APPENDIX A.—LAWS RELATING TO THE COOPERATION OF THE COAST AND GEODETIC SURVEY AND BUREAU OF FISHERIES WITH THE MARYLAND SHELL FISH COMMISSION.

The work of the Coast and Geodetic Survey and of the Bureau of Fisheries, in cooperation with the Maryland Shell Fish Commission, in surveying the oyster bars, establishing permanent landmarks at triangulation stations, and preparing for publication the necessary charts and technical and legal descriptions of boundaries and landmarks shown on these charts, has been executed in compliance with a request from the governor of the State of Maryland to the Secretary of Commerce and Labor, and by the authority of the following laws of the United States and Maryland:

[Act of Congress approved May 26, 1906.]

AN ACT To authorize the Secretary of Commerce and Labor to cooperate, through the Bureau of the Coast and Geodetic Survey and the Bureau of Fisheries, with the shellfish commissioners of the State of Maryland in making surveys of the natural oyster beds, bars, and rocks in the waters within the State of Maryland.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Commerce and Labor be, and he is hereby, authorized and directed, upon the request of the governor of the State of Maryland, to designate such officers, experts, and employees of the Bureau of the Coast and Geodetic Survey and of the Bureau of Fisheries as may be necessary to cooperate with the Maryland State board of shellfish commissioners in making a survey of and locating the natural oyster beds, bars, and rocks in the waters within the State of Maryland; and the Secretary of Commerce and Labor is hereby authorized and directed to furnish to the officers, experts, and employees of said Bureaus so detailed as aforesaid such instruments, appliances, and steam launches as may be necessary to make the survey aforesaid; and the Secretary of Commerce and Labor is hereby authorized to have made in the Bureau of the Coast and Geodetic Survey all the plats necessary to show the results of the aforesaid survey and the locations of the said natural oyster beds, bars, and rocks in the waters within the State of Maryland, and to furnish to the board of shellfish commissioners of the State of Maryland such copies as may be necessary, and for this purpose to employ, in the District of Columbia and elsewhere, such technically qualified persons as may be necessary to carry out the purpose of this act.

SEC. 2. That the Secretary of Commerce and Labor is hereby further authorized to have erected or constructed by the officers so detailed as aforesaid, while making such survey, such structures as may be necessary to mark the points of triangulation, so that the same may be used for such future work of the Coast and Geodetic Survey as the said Bureau may be hereafter required to perform in prosecuting the Government coast survey of the navigable waters of the United States located within the State of Maryland.

* * * * * * *

SEC. 4. That this act shall take effect from the date of its passage.

[Act of Congress approved June 30, 1906.]

AN ACT Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and seven, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and seven, namely: * * *

COAST AND GEODETIC SURVEY: * * * For any special surveys * * * including the expenditures authorized under Public Act Numbered One hundred and eighty-one, approved May twenty-sixth, nineteen hundred and six, and contingent expenses incident thereto, five thousand dollars, together with the unexpended balance under this appropriation for nineteen hundred and six and prior years which is hereby reappropriated and made available on this account for the fiscal year nineteen hundred and seven. * * *

[Act of Congress approved March 4, 1907.]

AN ACT Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and eight, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and eight, namely: * * *

COAST AND GEODETIC SURVEY: * * * For any special surveys * * * including expenses of surveys in aid of the shellfish commission of the State of Maryland, to be immediately available and to continue available until expended, twenty-five thousand dollars. * * *

[Act of Congress approved May 27, 1908.]

AN ACT Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and nine, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and nine, namely: * * *

COAST AND GEODETIC SURVEY: * * * For any special surveys * * * including expenses of surveys in aid of the shellfish commission of the State of Maryland, which expenses, including cost of plats and charts, shall not exceed fifteen thousand dollars in any one year, to be immediately available, twenty thousand dollars.

[Act of Congress approved March 4, 1909.]

AN ACT Making appropriation for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and ten, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and ten, namely: * * *

COAST AND GEODETIC SURVEY: * * * For any special surveys * * * including expenses of surveys in aid of the shellfish commission of the State of Maryland, which expenses, including cost of plats and charts, shall not exceed fifteen thousand dollars in any one year, to be immediately available, twenty thousand dollars.

[Act of Congress approved June 25, 1910.]

AN ACT Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and eleven, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and eleven, namely: * * *

COAST AND GEODETIC SURVEY: * * * For any special surveys * * * including expenses of surveys in aid of the shellfish commission of the State of Maryland, to be immediately available fifteen thousand dollars.

[Act of the Legislature of Maryland approved April 2, 1906.]

AN ACT To establish and promote the industry of oyster culture in Maryland, to define and mark natural oyster beds, bars and rocks lying under the waters of this State, to prescribe penalties for the infringement of the provisions of this Act, and * * *.

SECTION 1. *Be it enacted by the General Assembly of Maryland*, That the following sections be, and they are hereby, added to article 72 of the Code of Public General Laws, title "Oysters." * * *

SEC. 86. The Board of Shell Fish Commissioners shall, as soon as practicable after the passage of this Act, cause to be made a true and accurate survey of the natural oyster beds, bars and rocks of this State, said survey to be made with reference to fixed and permanent objects on the shore, giving courses and distances, to be fully described and set out in a written report of said survey, as hereinafter required. A true and accurate delineation of the same shall be made on copies of published maps and charts of the United States coast and geodetic survey, which said copies shall be filed in the office of the said commissioners in the city of Annapolis, and the said commissioners shall further cause to be delineated upon copies of the published maps and charts of the United States coast and geodetic survey, of the largest scale, one copy for each of the counties of this State in the waters of which there are natural oyster beds, bars and rocks, all natural beds, bars and rocks lying within the waters of such county, which maps shall be filed in the offices of the clerks of the Circuit Court for the respective counties wherein the grounds so designated may lie. * * *

SEC. 87. The Governor of this State is hereby requested to ask the assistance of the United States coast and geodetic survey, and of the United States Fish Commissioner, to aid in the carrying out of the provisions of the preceding section.

* * * * * * * *

SEC. 89. As soon as practicable after the first day of April, 1906, the said commissioners shall organize, and shall at once proceed, with the assistance of such person or persons as may be detailed by the United States coast and geodetic survey and the United States Fish Commissioner, to aid them in their work, and of such persons as may be appointed under the preceding section, to have laid out, surveyed and designated on the said charts, the natural beds and bars, and shall cause to be marked and defined as accurately as practicable the limits and boundaries of the natural beds, bars, and rocks as established by said survey, and they shall take true and accurate notes of said survey in writing, and make an accurate report of said survey, setting forth such a description of landmarks as may be necessary to enable the said board, or their successors, to find and ascertain the boundary lines of the said natural oyster beds, bars and rocks, as shown by a delineation on the maps and charts provided in this Act; said report shall be completed and filed in the office of the board in the city of Annapolis within ninety days after the completion of the survey of any county. Said commissioners shall cause the same to be published in pamphlet form, and transmit copies of the said to the Clerks of the Circuit court for the respective counties, where the charts have been filed or directed to be filed as hereinafter provided; the said report to be filed by the clerks of the several counties in a book kept for that purpose. And the said survey and report, when filed, subject to the right of appeal hereafter provided for in this Act, shall be taken in all of the courts of this State as conclusive evidence of the boundaries and limits of all natural oyster beds, bars and rocks, lying within the waters of the county wherein such survey and report are filed, and shall be construed to mean in all of the said courts that there are no natural oyster beds, bars or rocks lying within the waters of the counties wherein such report and survey are filed other than those embraced in the survey authorized by this Act, and that all areas of the Chesapeake Bay and its tributaries within the State of Maryland, not shown in the survey to be natural oyster beds, bars or rocks shall be construed in all the courts of the State to be barren bottoms and open for disposal by the State for the purpose of private planting or propagation of oysters thereon under the provisions of this Act; provided, that the said survey and report shall not be construed as to affect in any manner the holdings by citizens of this State in any lot which may have been appropriated or taken up under the laws of this State prior to the approval of this Act.

The law of the State of Maryland, passed March 9, 1842, authorizing officers of the United States Coast and Geodetic Survey to enter upon the lands within the State limits for the purposes of the survey, is as follows:

AN ACT Concerning the Survey of the Coast of Maryland.

SECTION 1. *Be it enacted by the General Assembly of Maryland*, That it shall and may be lawful for any person or persons employed under and by virtue of an act of the Congress of the United States, * * * at any time hereafter to enter upon lands within this State for the purpose of exploring, surveying, triangulating, or leveling, or doing any other matter or thing which may be necessary to effect the objects of said act, and to erect any works, stations, buildings, or appendages requisite for that purpose, doing no unnecessary injury to private or other property.

SEC. 2.[a] *And be it enacted*, That in case the person or persons employed under the act of Congress aforesaid, can not agree with the owners or possessors of the land so entered upon and used as to the amount of damage done thereto by reason of the removal of fences, cutting of trees or injury to the crop or crops growing on the same, it shall and may be lawful for the said parties or either of them to apply to the chief justice for the time being or one of the associate judges of the judicial district in which such land may be situated, who shall thereupon appoint three disinterested and judicious freeholders, residents of the same judicial district, to proceed with as much despatch as possible to the examination of the matter in question, and the faithful assessment of the damages sustained by the owners or possessors aforesaid, and the said freeholders or a majority of them, having first taken and subscribed an oath or affirmation before the chief or associate justice aforesaid or other person duly authorized to administer the same, that they will well and truly examine and assess as aforesaid, and having given five days' notice to both parties of the time of their meeting, shall proceed to the spot, and then and there upon their own view and if required, upon the evidence of witnesses (to be by them sworn or affirmed and examined), shall assess the said damages, and shall afterward make report thereof and of their proceedings in writing under their hands and seals and file the same within five days thereafter in the office of the clerk of the county in which the land aforesaid is situated, subject to an appeal by either party to the county court of the said county within ten days after filing as aforesaid, and the said report so made as aforesaid if no appeal as aforesaid be taken, shall be held to be final and conclusive as between the said parties, and the amount so assessed and reported shall be paid to the said owners or possessors of the land so damaged within twenty days after the filing of said report, and the said chief or associate justice as aforesaid, shall have authority to tax and allow upon the filing of said report, such costs, fees and expenses to the said freeholders for the performance of their duty as he shall think equitable and just, which allowance shall be paid by the person or persons employed under the act of congress aforesaid, within the time last above limited, but if an appeal as aforesaid be taken, the case shall be set down for hearing at the first term of county court aforesaid, ensuing upon and after appeal, and it shall be lawful for either party immediately after the entry of such appeal, to take out summons for such witnesses as may be necessary to be examined upon the hearing aforesaid, and the said court shall have power in its discretion to award costs against which ever the final judgment shall be entered, and such appeal at the option of either party may and shall be heard before and the damage assessed by a jury of twelve men to be taken from the regular panel and elected as in other cases.

SEC. 3. *And be it enacted*, That if any person or persons shall wilfully injure or deface or remove any signal, monument or building or any appendage thereto, erected, used or constructed under and by virtue of the act of congress aforesaid, such person or persons so offending shall severally forfeit and pay the sum of fifty dollars with costs of suit to be sued for and recovered by any person who shall first prosecute the same before any justice of the peace of the county where the person so offending may reside, and shall also be liable to pay the amount of damages thereby sustained, to be recovered with costs of suit in an action on the case, in the name and for the use of the United States of America, in any court of competent jurisdiction.

[a] Under the rulings of the Comptroller of the Treasury no damages can be collected except through the United States Court of Claims unless an agreement has been made in advance.

Appendix B.—THE HAMAN OYSTER CULTURE LAW.

[Extract from Second Report of Shell Fish Commission.]

OBJECT.

"The legislature in placing chapter 711 of the acts of 1906, better known as the Haman Oyster Culture Law, upon the statute books of Maryland, had a twofold object in view:

1. To *encourage* an industry in oyster culture upon the *barren bottoms* beneath the tidewaters of the State.
2. To *prevent* the leasing of *natural oyster bars* for the purpose of oyster culture."

SURVEY.

"To make the leasing of barren bottoms possible and the leasing of natural bars impossible, provision was made for a survey of the natural bars for the purpose of accurately locating and marking the same. It was definitely provided that no barren bottoms should be leased in any part of the State until the natural bars of that region had been surveyed, charted, and marked with buoys."

Definition of a Natural Oyster Bar.

NATURAL BAR NOT DEFINED.

"The Shell Fish Commission is instructed by section 90 of the Haman Oyster Culture Law to exercise its judgment liberally in favor of the natural bars when surveying, charting and buoying them, but other than this the Commission is uninstructed in this important matter. The responsibility of defining a natural bar is placed upon the Commission."

DIVERSITY OF OPINION.

"No definition of a natural oyster bar could be formulated by any man or body of men which would meet with the approval of all parties concerned. Oystermen, as a rule, hold that all bottoms where oysters grow or have grown naturally even though now practically barren of oysters should be considered natural bars. Other citizens of the State who are not directly interested in the oyster business, but interested in the oyster industry from the standpoint of revenue, hold, as a rule, that no bottoms should be excluded from leasing for oyster culture which, by methods known to oyster culturists, may be made to yield a greater number of oysters than they now produce."

"It should be evident to every one that neither of these definitions could be adopted by the Commission as a working basis for determining which of the grounds surveyed are natural oyster bars."

THE GOLDSBOROUGH DEFINITION.

The definition of a natural oyster bar which very nearly approaches a reasonable and satisfactory compromise between the views of the subject held by *oystermen* on one hand and by *oyster culturists* on the other is that contained in an opinion rendered by Judge Charles F. Goldsborough in the circuit court for Dorchester County in the July term, 1881, in the case of William T. Windsor and George R. Todd *v.* Job T. Moore.

This definition has been adopted by the Shell Fish Commission as the basis for the determination of the status of the various oyster bottoms surveyed and is as follows:

What then is a natural bar or bed of oysters? It would be a palpable absurdity for the State to attempt to promote the propagation and growth of oysters and to encourage its citizens, by a grant of land, to engage in their culture, if the lands authorized to be taken up were only those upon which oysters do not and can not be made to grow. That there may be lands covered by water in the State where no oysters can be found, but where, if planted, they could be cultivated successfully, may be possible, but, if so, I imagine that their extent must be too limited for them to be of much practical, general advantage for the purposes of such a law as the one under discussion; but there are thousands of acres of hard and shifting sands where oysters not only are not found, but where it would be folly to plant them, and these latter it can not be supposed that the State intended to offer to give away, for the simple reason that the State could not help knowing that nobody would have them.

Upon the other hand there are large and numerous tracts where oysters of natural growth may be found in moderate numbers, but not in quantities sufficient to make it profitable to catch them, and yet where oysters may be successfully planted and propagated. In my opinion these can not be called natural bars or beds of oysters, within the meaning of the Act of Assembly, and it is just such lands as these that the State meant to allow to be taken up under the provisions of the above-mentioned section of the Act.

But there is still another class of lands where oysters grow naturally and in large quantities and to which the public are now and have been for many years in the habit of resorting with a view to earning a livelihood by catching this natural growth, and here, I think, is the true test of the whole question. Land can not be said to be a natural oyster bar or bed merely because oysters are scattered here and there upon it, and because if planted they will readily live and thrive there; but whenever the natural growth is so thick and abundant that the public resort to it for a livelihood, it is a natural oyster bar or bed and comes within the above-quoted restriction in the law, and can not be located or appropriated by any individual.

APPLICATION OF DEFINITION.

Before this definition may be of use in determining, accurately and scientifically, the status of an oyster ground, its central idea, "livelihood," must be expanded into accurately determinable factors, and these factors must be combined into a practical scheme of investigating the condition of the ground under consideration.

Stated briefly, a *livelihood* is represented by a *sum of money* obtained from the sale, at a fixed *price*, of a certain *quantity of oysters* gathered in a given *time* from an allotted *area* of ground.

Knowing the value of each of these factors it becomes possible to calculate the number of oysters an oyster ground must produce per square yard in order that oystermen may secure a livelihood by working upon it.

NOTE.—The factors into which the Commission resolved the livelihood problem, the value assigned to each factor, and the scheme devised for practical use in examining and applying the definition to oyster bottoms are given in outline in their second report under the heading of the preceding extract, and in detail in their first report on pages 32 to 69.

APPENDIX C.—SUMMARY OF THE PARTICULAR SURVEYING OPERATIONS WHICH CONSTITUTE AN "OYSTER SURVEY" AS NOW BEING CARRIED ON IN MARYLAND.

Explanation.—A brief account of the particular surveying operations which constitute an "oyster survey" as now being carried on in Maryland will assist in the interpretation of records contained in the technical part of this report, and will be of interest to many who may not understand the necessity for the great amount of work being done or its complicated character.

To those familiar with methods used in surveying and charting the characteristic features of large bodies of water there is an evident necessity for the various operations performed, especially when it is known that the boundaries of the public oyster bars and of the private lots leased for purposes of oyster culture must be surveyed and charted with the greatest practical accuracy. To others it will be sufficient to state that the actual experience gained from oyster surveys in other States has proven that in order to avoid endless dissatisfaction and litigation it is necessary to accurately locate and permanently establish oyster boundaries as is now being done in Maryland.

Triangulation survey.—Such refinement of survey work as that demanded by the conditions of an oyster survey when carried on at considerable distances offshore can only be obtained by the use of a system of triangulation as a framework or foundation. Therefore, a triangulation survey including the permanent marking of the positions of landmarks with monuments and a record of the descriptions of their locations for future recovery is a necessary operation of a complete oyster survey.

Topographic survey.—The technical records which establish the relation between the offshore oyster boundaries and triangulation landmarks are sufficient for the requirements of engineers in making resurveys, but do not supply the needs of others who are interested in the same boundaries by reason of their occupation as oystermen concerned as to the public oyster bars, or oyster culturists concerned as to the leasable bottoms. For these it is necessary to have the charts of the survey show the relation of the shore line and other topographic features to the boundaries of the public oyster bars and private oyster farms. Therefore, a topographic survey is a necessary operation of a complete oyster survey

Hydrographic survey.—In the settlement of the important question of what is, or what is not, a natural oyster bar, and in the consideration of bottoms to be selected for purposes of oyster culture, information as to the depth of water and the character of the bottom is required. Therefore, a hydrographic survey is a necessary operation of a complete oyster survey.

Necessary foundation for an oyster survey.—Consequently, the necessary components of a satisfactory foundation for a complete oyster survey are the three classes of survey operations technically named triangulation, topography, and hydrography, or, stated in another way, the foundation of a practical oyster survey includes the surveying operations usually followed by the Coast and Geodetic Survey leading up to the preparation and publication of nautical charts.

Special surveys and investigations pertaining to oysters.—Having obtained this cartographic survey for a foundation, partly by new work and partly from records of previous work of the Government, the combined operations[a] making up an "oyster survey" are completed by superimposing on this foundation special surveys and investigations pertaining particularly to oysters or other shell fish.

The special surveys pertaining to oysters furnish information as to the location and outline of oyster-shell bottoms, and are carried on by the sounding boat party in addition to the usual hydrographic work.[b] This operation consists of the observation and record of the character of vibration of a wire and chain apparatus which is dragged over the bottom, the vibrations or lack of vibrations indicating the presence and quantity of shells or absence of shells.

The special oyster investigations[c] consist of the actual determination of the kind and quantity of oysters on the bottom, and such economic and biological studies of the supply of oyster food, density of water, character of the bottom, and other important matters as affect the growth of oysters. In this work the oyster investigation stations are located and buoyed by the hydrographic party while engaged in the survey of the oyster-shell limits. They are selected with the view of obtaining characteristic data which can be used for the interpretation of the recorded vibrations of the chain apparatus at all other points covered by the survey.

Preparation of results.—The actual surveying operations and oyster investigations having been completed for any one county, there still remains technical work of nearly equal magnitude to that described.[d] This work consists of the preparation of charts and technical descriptions of boundaries and landmarks for publication by the Government, the preparation of that part of the annual report of the Commission covering the special oyster surveys and investigations, the making of the leasing charts and finished projections, and finally the filing of the oyster charts and records with the courts and the Commission, thus opening a county for oyster culture.

Summary.—From the foregoing account it can be seen that a complete oyster survey properly conducted so as to answer all practical requirements of the present and permanency of results for the future is a very complicated affair, involving many lines of surveying and other scientific work, and requiring the professional services of experts in the various operations of cartographic surveying and shell-fish investigations.

[a] See Appendix D of this publication for "Statistics of results of combined operations of the Government and State."

[b] See pages 104 to 123 of "First Annual Report of Maryland Shell Fish Commission."

[c] See pages 30 to 67 and 129 to 199 of "First Annual Report of Maryland Shell Fish Commission."

[d] No mention is made here of the large amount of administrative work of the Commission, which is greatly complicated and increased by the effect of the oyster-survey operations on many thousands of people whose interests are more or less involved; or of the large amount of survey work involved in the survey and record of the boundaries of oyster lots leased from the State by private individuals for the purposes of oyster culture.

APPENDIX D.—STATISTICS OF RESULTS OF THE COMBINED OYSTER SURVEY OPERATIONS OF THE GOVERNMENT AND STATE.[a]

Operations.	Anne Arundel County.	Somerset County.	Wicomico County.	Worcester County.	Calvert County.	Charles County.	Total.[b]
Beginning of field work	June 29, 1906	May 2, 1907	Aug. 27, 1907	Nov. 8, 1907	May 2, 1908	Aug. 18, 1908	.....
Filing of certified charts and reports	June 20, 1907	July 1, 1908	Dec. 1, 1908	Apr. 12, 1909	Dec. 14, 1909	Jan. 27, 1911	.....
Natural oyster bars surveyed and delineated	91	37	15	28	41	15	227
Acres of natural oyster bars	33,666	27,566	2,038	1,655	12,303	2,285	[c] 79,513
Crab bottoms surveyed and delineated	.....	54	.....	.....	.....	.....	54
Acres of crab bottoms	.....	32,108	.....	.....	.....	.....	32,108
Clam beds surveyed and delineated	.....	3	.....	.....	.....	.....	3
Acres of clam beds	.....	506	.....	.....	.....	.....	506
Boundary buoys located and planted	362	154	53	108	149	51	877
Triangulation landmarks established	123	86	30	48	78	42	365
Miles of shore line covered by triangulation	110	125	46	95	95	32	487
Square miles of water covered by triangulation	220	375	44	110	157	20	902
Miles of examination of shell bottom with chain apparatus	369	296	58	63	250	38	1,074
Oyster investigation stations occupied	440	679	162	147	667	113	2,208
Tide stations established	4	3	1	1	2	1	12
Number of soundings over shell bottoms	37,049	17,904	3,387	3,649	11,292	1,631	74,912
Square miles covered by soundings and chain apparatus	58	47	3	3	30	4	135
Projections prepared and plotted	9	13	2	5	8	3	38
Leasing charts prepared	13	12	2	3	5	2	37
Oyster charts published	4	6	2	3	5	1	21
Reports published	2	2	2	2	2	2	8
Progress maps published	2	2	2	2	2	2	8

[a] These statistics do not include the large amount of triangulation, topography, and hydrography resulting from previous work of the Coast and Geodetic Survey, which was utilized in the preparation of the published oyster charts and records. Work in St. Marys, Baltimore, Kent, Queen Anne, and Dorchester counties has been finished, but final statistics of results will not be published until these counties are opened for oyster culture.

[b] Less quantities covered by statistics of more than one county.

[c] Total area of natural oyster bars of Connecticut is 5,770 acres.

O

COAST AND GEODETIC SURVEY

PROGRESS MAP

CHARLES COUNTY

MARYLAND

To accompany report of work of United States Coast and Geodetic Survey in cooperation with the Maryland Shell Fish Commission

1910

Projection L

CHART No.19a

CHART No.19

Projection K

Projection R

Projection F

Projection Q

CHART No.26

CHARLES COUNTY ST. MARY'S COUNTY

CALVERT COUNTY ST. MARYS COUNTY

Note: Area covered by Chart No.19a is printed on this section of Chart No.19, and is also shown on sub-chart on Chart No.26

Note: Area covered by Chart No.19a is printed on this section of Chart No.26

- Landmarks Coast Survey Triangulation Stations
- Waters contiguous to county
- Waters within territorial limits of county
- Limits of projections on file at Washington
- Limits of charts published by Coast and Geodetic Survey

Scale 1/80000

Statute Miles

Nautical Miles

Kilometers

POTOMAC RIVER

ST. CLEMENT BAY

BRETONS BAY

Blakistone I Light

Cobb Point Bar Light

Sacred Heart Church Spire (Budkwood)

Rock Point Catholic Church

River Springs Catholic Chapel Cro

Prince, Leitch, Fodder, Teague, Duena, Catholic Church Cross, Hallowing, Indian, Dwarf, Solhoron, Bus3, Billiard, Morsel, Trent, Collins, Sheridan, Kill, Cremona, Bagle, Opphit, Photo, Pghit, Forr, Barber, Upper, Kef, Stoddard, Cohouck, Huyden, Perry, Burr, Bowman, Pact, Bedling, Oust, Farr, Hedney, Lyon, Charles, Weist, Blakistone, Hard Cross, Corner, Pier, St Margaret 2, Bound, Bailey, St Catherine, Waterloo

15° 20° 25° 30° 35° 40° 45° 50° 55° 76°

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